EXECUTIVE SUMMARY

REGIONAL COMPREHENSIVE PLAN: CHARTING A PATH FOR SOUTHERN CALIFORNIA'S FUTURE

The Regional Comprehensive Plan (RCP) is a problem-solving document that directly responds to what we've learned about Southern California's challenges through the annual State of the Region report card. It responds to SCAG's Regional Council directive in the 2002 Strategic Plan to develop a holistic plan that lays out a plan for defining and solving our housing, traffic, water, air quality, and other regional challenges.

The RCP sets a path forward in two key ways. First, it ties together SCAG's role in transportation, land use, and air quality planning and says we need to do more than we're doing today. Second, it recommends key roles and responsibilities for public and private sector stakeholders and invites them to implement reasonable policies that are within their control.

This is a proactive, big-picture advisory plan that defines what a livable, sustainable, successful region looks like and challenges us to push through barriers. The RCP describes what our region could look like if current trends continue, defines a vision for a healthier region, and recommends an Action Plan that could get us there by 2035. By balancing resource conservation, economic vitality, and quality of life, it lays out a long-term planning framework that shows how we can respond to growth and infrastructure challenges in a comprehensive way.

The RCP recognizes that there are many ways to address the region's challenges. As such, while the RCP recommends solutions by calling for more integrated resource planning, it does not mandate them. For example, local governments are asked to consider this Plan's recommendations in General Plan updates, municipal code amendments, design guidelines, and other implementing actions. However, there are undoubtedly alternative means to the same ends.

The RCP is being developed to:

- Respond to the SCAG Regional Council's direction to develop a comprehensive plan that looks at environmental, social, and economic issues in concert and recommends policies that SCAG, local governments, and other stakeholders should consider.
- Inform local, subregional, and county economic and resource plans that are often limited by geography or scope. For example, a county-wide resource plan for open space may fail to recognize the habitat value of linking to adjacent county open space plans.
- Help meet federal transportation planning requirements that call for more integrated resource planning, particularly increased integration of environmental concerns into transportation plans through expanded consultation.
- Improve guidance to local governments through more comprehensive regional input into the development of local General Plans and major development through the region's Intergovernmental Review process.
- Provide a regional response and strategy for meeting climate change mandates that call for dramatic reductions in greenhouse gases.
- Offer a comprehensive, integrated policy plan that helps position Southern California to get its fair share of revenue from federal and state funding programs, such as the traffic, housing, water, and parks infrastructure bonds approved in 2006.

- Help stakeholders make the most of their limited resources by highlighting priority policies for future implementation that maximize benefits both locally and regionally.

Ultimately, the RCP sets the stage for regional dialogue that translates into action. Success depends on the region's ability to agree on our challenges, evaluate solutions, and implement change through consensus. As the council of governments for Southern California, SCAG is uniquely positioned to work with its membership to take a leadership role in sustainability planning—integrated planning that meets our needs without squandering resources for the future. As the region's metropolitan planning organization, SCAG can help prioritize federal and state funds for programs that support the RCP's vision and outcomes.

To that end, SCAG plans to update the RCP on a regular basis in concert with the Regional Transportation Plan to reflect changes in legislation, technology, policy, and other variables.

ASSESSING OUR CHALLENGES

Southern California is witnessing historic change at the global, national, and regional level. As our world continues to change in sometimes dramatic ways, our built-out region is increasingly faced with tougher policy decisions that will shape the way our region will look like in 25 years if we don't change the way we do business:

- Our region's population continues to increase and challenges us to find better ways to grow. We need to work within the region and with our partners in Kern County to the north and San Diego County to the south to address growth issues that threaten our quality of life. Failure to do so threatens the open spaces that provide critical wildlife habitat.
- Making a real dent in traffic congestion is getting tougher and increasingly more expensive for everyone. Our difficult housing market and the "drive until you qualify" phenomenon have doomed more and more of us to mega-commutes through choked freeways and streets. Without solutions, traffic speeds on freeways will slow to 28 mph within 25 years. Major changes to the way we move people and freight must begin now.
- After decades of steady progress, our air quality improvements have leveled off as growth has begun to offset the technological advancements that have served us until now. Today, we face an air quality crisis, with more than 5,000 people premature deaths from fine particulate matter. We must respond to more stringent air quality standards for $PM_{2.5}$ and even unregulated smaller pollutants called nano-particles by reducing our reliance on diesel and other petroleum-based, combustion engines.
- The limits of our energy supply are increasingly tested every summer with constant threats of rolling blackouts. We are dependent on imported petroleum, natural gas, and coal, which account for 85 percent of our energy use. As we question the long term viability of a petroleum-based energy future, we can't afford to delay to explore real options to combustion-based energy sources.
- Our water supplies are increasingly threatened by pollution and growth is often limited by whether there's adequate supply. The quality of our surface and groundwater supplies is equally important and must be protected through better management practices.

- As our demographics continue to change, our economy continues to become more service- and technology-oriented, with manufacturing outsourced to other regions and other countries. Over time, our region needs to find a balance that promotes regional economic sustainability through promotion of local industries while recognizing its important link to the global economy.
- We have to rethink our current waste management approaches and realize that waste is the result of the inefficient use of our limited, natural resources. Our region generates over 80 million tons of trash each year. Burying the problem in landfills does not make it go away. We need to step up our efforts on reducing waste, reuse of materials, recycling, and developing alternative technologies.

In addition, forces on the national and international scale are impacting our region:

- Climate change. The body of scientific evidence shows that our global climate is heating up at unprecedented rates that threaten life as we know it. The vast Southern California region has contributed to the highest CO_2 emissions levels in recorded history (see below). This threatens to impact all aspects of our communities, whether it's reduced water supplies, habitat loss, increased air pollution, or public health impacts. The secondary effects of climate change are almost as troubling; for example, hotter cities need more cooling, which increases power plant usage that contributes further to the vicious cycle of greenhouse gases.
- Energy uncertainty. As the peak of the world's petroleum production rate is reached, there could be profound consequences to our region's economy. Southern California's transportation, agricultural and industrial systems are highly dependent on inexpensive oil. Any production decline and resulting price increases will have negative implications for the global and regional economy; the severity will depend on the rate of decline and the linked increases in prices and our ability to find alternatives for petroleum.
- Global economy. If Southern California were a country, we'd be the 15th largest economy in the world. In this globalized economy, our region is increasingly susceptible to outside influences like international economic downturns that pose further challenges.

These challenges call for action, because the consequences of inaction are potentially profound (see the "Fast Facts" sidebar). This need for action is all the more urgent because all of these issues are tightly linked. For example, failure to address energy supply issues has direct and indirect impacts on air quality and public health.

Forming a Vision and Implementing an Action Plan

The RCP is a structured policy framework that links broad visionary principles to an action plan that moves the region towards balanced goals. It is based on the following vision and guiding principles:

RCP Vision

> To foster a Southern California region that addresses future needs while recognizing the interrelationship between economic prosperity, natural resource sustainability, and quality of life. Through measured performance and tangible outcomes, the RCP serves as both an action plan for implementation of short-term strategies and a

call to action for strategic, long-term initiatives that are guided by the following Guiding Principles for sustaining a livable region.

RCP Guiding Principles

1. Improve mobility for all residents. Improve the efficiency of the transportation system by strategically adding new travel choices to enhance system connectivity in concert with land use decisions and environmental objectives.
2. Foster livability in all communities. Foster safe, healthy, walkable communities with diverse services, strong civic participation, affordable housing and equal distribution of environmental benefits.
3. Enable prosperity for all people. Promote economic vitality and new economies by providing housing, education, and job training opportunities for all people.
4. Promote sustainability for future generations. Promote a region where quality of life and economic prosperity for future generations are supported by the sustainable use of natural resources.

The RCP looks at nine key areas of public policy that are linked closely to these guiding principles (list nine chapters in sidebar). Each chapter is organized into three sections:

- **Goals.** Each goal will help define how sustainability is defined for that resource area.
- **Outcomes.** These focus on quantitative targets that define progress toward meeting the RCP's Goals. Where possible, they are clearly defined (e.g., a 20% reduction in greenhouse gas emissions from 2007 levels), capable of being monitored with existing or reasonably foreseeable resources, and have a strong link to sustainability goals.
- **Action Plan.** This critical part of the RCP lays out comprehensive implementation strategies that recommend how the region can systematically meet the RCP's quantitative Outcomes and achieve its Goals, Guiding Principles, and Vision. Each Action Plan is contains:
  - Constrained Policies. This includes a series of recommended near-term, feasible policies that stakeholders should consider for implementation. For example, the RCP will call on SCAG to adopt certain policies that reflect its role as a planning agency, council of governments, and metropolitan planning organization. The RCP also recommends potential policies for consideration by local governments and other key stakeholders. Clear policies will improve the Intergovernmental Review process and help SCAG and local governments assess the consistency of local projects to the RCP.
  - Strategic Initiatives. This encompasses longer-term strategies that require significant effort to implement but are necessary to achieve the RCP's desired Goals and Outcomes. Most of these initiatives are not constrained and will require political will, enabling legislation, new funding sources, and other key developments to become a reality. In most cases, this tier of strategies is the key to achieving the region's sustainability Goals and Outcomes.

The RCP identifies policies that represent best practices or address needed reform for each resource area. However, public agencies and local stakeholders must find ways to evaluate and prioritize the best options in resource-constrained environments where funding is limited.

Setting Priorities

Because there is no silver bullet that can solve our region's array of challenges, our region is faced with many policy options that should be evaluated before tough decisions are made. There are a variety of performance measures that can be used to rank policy options, such as cost-effectiveness, cost-benefit ratio, and environmental benefits.

The RCP looks at the body of recommended policies and highlights those that can produce the most benefits across resource areas. In doing so, the RCP provides a framework for local decision-making that helps advance those policies that "provide multiple benefits for the price of one." The RCP's priority policies are based on the following qualitative criteria:

- Potential for direct and indirect benefits over multiple resource areas.
- Potential to address other policy objectives, including public health and environmental justice.
- Potential to respond to climate change concerns and mandates.

Roles and Responsibilities

As an advisory document, the RCP identifies potential policies that the public and private sector should consider in its planning and daily operations. The RCP reaffirms the institutional roles that SCAG, local governments, resource organizations, and the private sector have in resource planning and program. To that end, the RCP recommends the following roles and responsibilities for key stakeholders:

- SCAG. As a council of governments, SCAG can take a leadership role by working with its member jurisdictions to promote sound planning policies through guidance, financial incentives, and other means. The RCP continues an ongoing dialogue with 187 local governments to develop consensus about how Southern California thinks globally and regionally and acts locally. In its role as a metropolitan planning organization, SCAG can also help advance integrated policies through its funding decisions.
- Local governments. Local jurisdictions have the land use authority to promote balanced growth and other local initiatives that promote integrated planning. In their capacity as major employers, cities also can set an example in their communities by adopting proactive policies that reduce waste, promote energy efficiency, and address other goals.
- Transportation commissions. With their role in planning and programming transportation projects, commissions can modify their criteria to help promote integrated planning objectives. While mobility benefits will also be a critical factor, commissions can look at other environmental and social criteria to provide a more balanced view of the benefits of their plans, programs, and projects.
- Resource agencies and conservation groups. These organizations work every day to promote better resource management, economic development, and other social and environmental policies and programs. The RCP offers these organizations the opportunity to

discuss challenges and opportunities through a more regional approach.

- Private sector. Businesses are urged to take a proactive role in addressing the goals of the region through voluntary changes in their practices. Whether it's reducing consumer waste associated with product packaging or promoting greener building practices in new development, the private sector has a key role in promoting programs that are consistent with the RCP.
- The public. The long-term well-being of our region ultimately serves the needs of all of us, our kids, and future generations. Our decision-makers need to know that solving our environmental, economic, and quality of life problems is something worth working for.

Relationship of RCP to Compass Blueprint and the Regional Transportation Plan

This integrated plan is closely tied to both SCAG's Compass Blueprint and Regional Transportation Plan. On one hand, the RCP complements the existing SCAG Compass Blueprint and the 2008 RTP. On the other, it also sets the direction for how both programs can evolve in the future.

The RCP builds off the growth management framework of the Compass Blueprint by promoting natural resource policies that help "green" the region as we move toward more sustainable growth. However, it also calls for improved integration of Blueprint into the Regional Transportation Plan. Future transportation plans should better promote projects that are designed to serve Compass Blueprint areas that have or are anticipated to have more population and job opportunities. Similarly, the RCP incorporates the recommendations from the existing RTP but also clarifies the need for further action in the future to address federal and state mandates.

Air Quality

In 1970, the U.S. Environmental Protection Agency (EPA) developed regulations targeting six "criteria" pollutants that have adversely affected human health and welfare: ozone, particulate matter, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). Since that time, effective federal, state, and regional requirements and air quality management plans have jointly reduced hundreds of tons of air pollution each day from mobile, area, and stationary sources in Southern California.

Despite this progress, air pollution continually plagues Californians and especially Southern California. The 2006 State of the Region Report showed that in 2005, the South Coast Air Basin, one of the four air basins in the SCAG region, continued to have the highest concentration levels of ozone and $PM_{2.5}$ in the nation. Additionally, the American Lung Association reported that Los Angeles-Long Beach-Riverside ranked number one as the most polluted cities in the United States.[1]

The path to solving the air quality issues will not be easy. Significant efforts and continued collaboration from federal, state, and local agencies is necessary to effectively combat the air quality problems the SCAG region faces.

Health Effect of Air Pollution

Clean air is a basic precondition of our health. Many people suffer from exposure to many air pollutants on a daily basis, setting our health at critical risk.

The human health effects of air pollution have resulted in widespread impacts on public health. Most air toxics have no known safe levels, and some may accumulate in the body from repeated exposures. Air pollution can irritate the eyes, throat and lungs. Even at low levels, pollutants may cause serious, long-term effects, such as damaged lung function, respiratory illnesses, and even cancer. The table below shows the health effects of some of the common pollutants found in our air and examples of some of the sources of these pollutants.

Morbidity

The term *morbidity* refers to the incidence rate or prevalence rate of a disease. Epidemiological reports have revealed that decreased lung growth rates, decreased lung function performance (the measurable ability to move air through the airways), and increased respiratory symptoms are prevalent in children growing up in Southern California communities who reside in areas with higher relative levels of NOx, PM, and various PM constituents.[2]

Recent studies have also found that the number of hospital admissions and emergency room visits for all respiratory causes (infections, respiratory failure, chronic bronchitis, etc.), including asthma, show a consistent increase as ambient ozone levels increase in a community. These excess hospital admissions and emergency room visits are observed when hourly ozone concentrations are as low as 0.08 to 0.10 parts per million (ppm).[3]

The Children's Health Study, conducted by researchers at the University of Southern California, furthered the evidence of a positive relationship between levels of pollution and morbidity. The study followed a cohort of children living in 12 communities in southern California exposed to differing levels of air pollution for several years throughout their lifetime.

A publication from this study revealed that school absences in fourth graders for respiratory illnesses were associated with ambient ozone levels. An increase of 20 parts per billion (ppb), ozone was associated with an 83% increase in illness related absence rates.[4]

Mortality

Numerous recent studies have found positive associations between increases in pollution levels and excess risk of mortality. Significant associations for $PM_{2.5}$ for both total mortality and cardio-respiratory mortality were reported in a study using data from the American Cancer Society. The Harvard Six Cities Study evaluated several size ranges of particulate matter and reported significant associations with PM_{10}, $PM_{2.5}$, sulfates, and non-sulfate particles.[5] The results indicated that pollution was positively associated with death from lung cancer and cardiopulmonary disease. Mortality was most strongly associated with air pollution with fine particulates, including sulfates.[6]

Common Pollutants: Health Effect and Sources

Pollutant	Health Effects	Examples of Sources
Particulate Matter	Increased Respiratory Disease Lung Damage Premature Death	Cars and trucks (especially diesels) Fireplaces and woodstoves Windblown dust from roadways, agriculture and construction
Ozone (O_3)	Breathing difficulties Lung damage	Formed by chemical reactions of air pollutants in the presence of sunlight Common sources: motor vehicles, industries, and consumer products
Carbon Monoxide (CO)	Chest pain in heart patients Headaches, nausea Reduced mental alertness Death at very high levels	Any source that burns fuel such as cars, trucks, construction and farming equipment and residential heaters and stoves
Nitrogen Dioxide (NO_2)	Lung damage	Any source that burns fuel such as cars, trucks, construction and farming equipment and residential heaters and stoves
Sulfur Dioxide (SO_2)	Lung damage	Fuel combustion, smelting, manufacture of sulfuric acid, conversion of wood pulp to paper, incineration of refuse and production of elemental sulfur Coal burning
Sulfates (SO_4^{2-})	Decrease in ventilatory function Aggravation of asthmatic symptoms Increased risk of cardio-pulmonary disease	Combustion of petroleum-derived fuels that contain sulfur
Toxic air contaminants	Cancer Chronic Eye, Lung or Skin Irritation Neurological and Reproductive Disorders	Cars and Trucks Especially Diesels Industrial Sources (e.g. Chrome Platers) Neighborhood Businesses, (e.g. dry cleaners) Building Materials and Products

Source: California Air Resources Board/SCAQMD

A study performed by the American Cancer Society cohort researched the links of long-term exposure to air pollution and overall health. The researchers estimated that, on average, a 10µg/m^3 increase in fine particulates was associated with approximately a 4% increase in total mortality, a 6% increase in cardiopulmonary mortality, and an 8% increase risk of lung cancer mortality.[7]

The numerous scientific literatures and research indicate that an increased risk of mortality and morbidity is associated with air pollution at ambient levels.

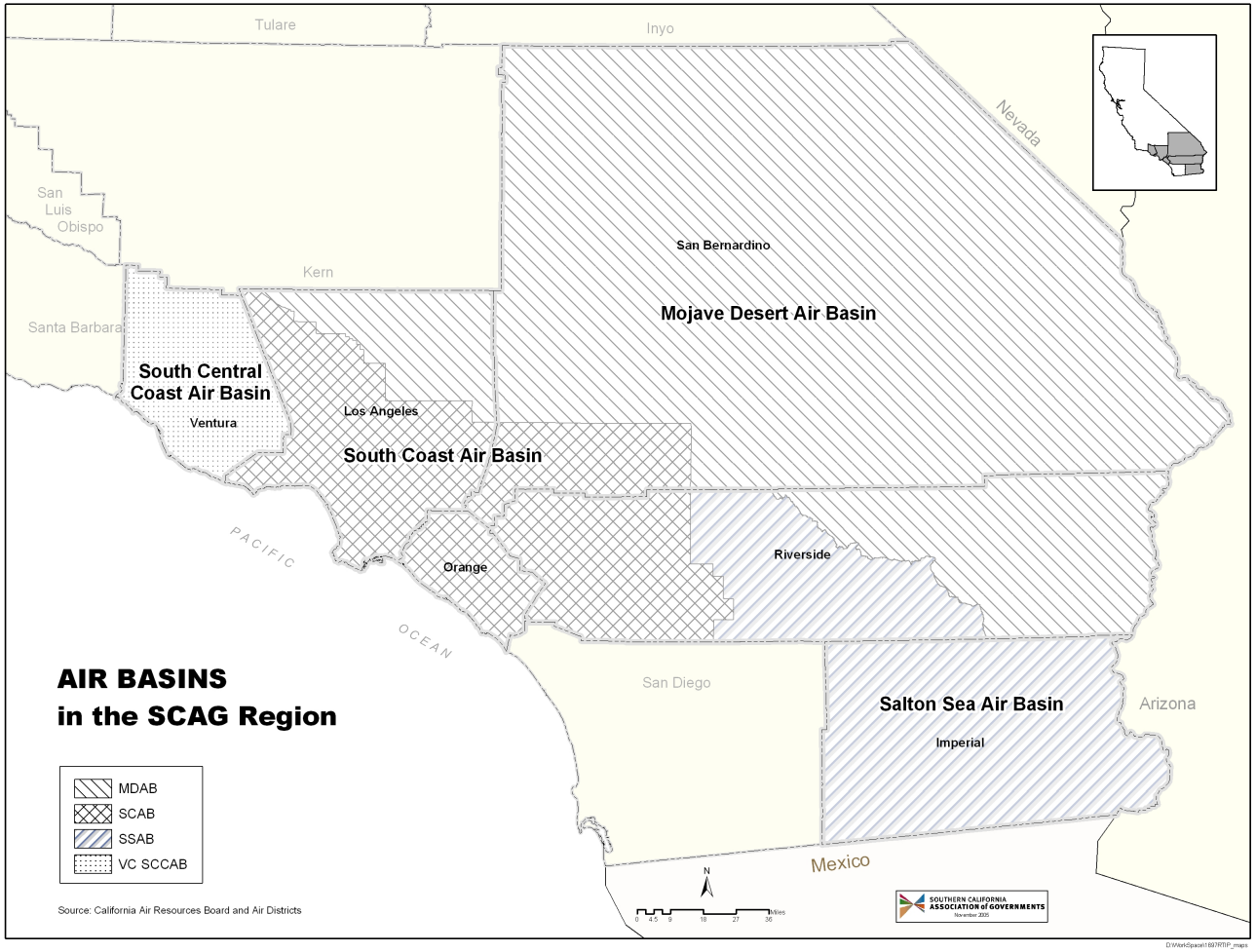
Air Quality Planning

The federal Clean Air Act (CAA) establishes air quality standards and planning requirements for various air pollutants. To comply with the CAA in achieving the National Ambient Air Quality Standards (NAAQS), the ARB develops State Implementation Plans (SIPs) for federal non-attainment and maintenance areas. In California, SIP development is a joint effort of the local air agencies and ARB working with federal, state, and local agencies (including the Metropolitan Planning Organizations). Local Air Quality Management Plans (AQMPs) are prepared in response to federal and state requirements.

ARB recommends the federal non-attainment area boundaries to EPA for final designations. Subsequently, the EPA finalizes and defines the boundaries of the federally designated non-attainment areas for each criteria pollutant, as defined below. In California, the state legislature defines the air basins. The following summarizes the air basins in the SCAG region and identifies the associated air district.

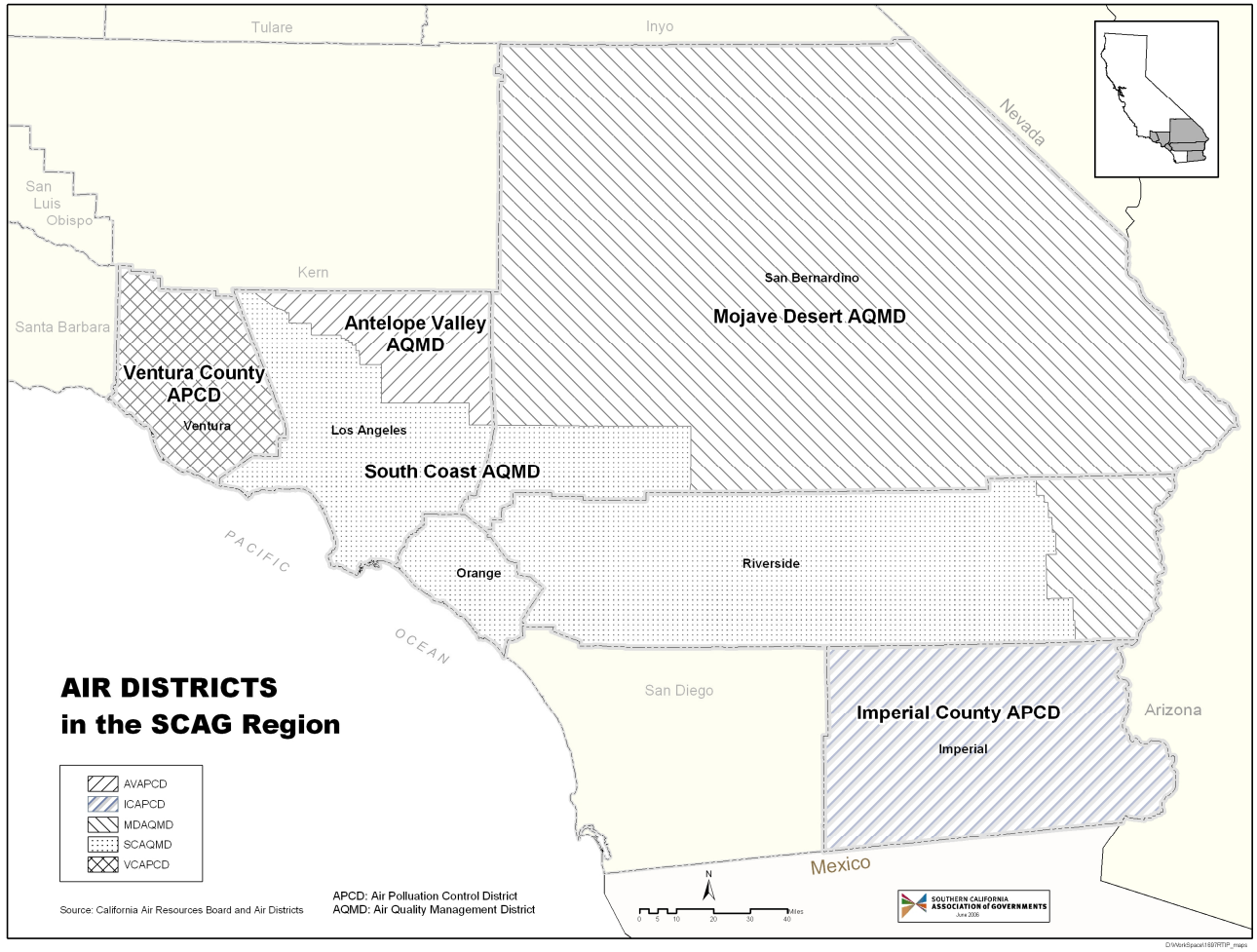
- **The South Coast Air Basin (SCAB):** Covers the urbanized portions of the Los Angeles, Riverside, and San Bernardino counties as well as the entire county of Orange and is within the jurisdiction of the SCAQMD.
- **The Ventura County portion of the South Central Coast Air Basin (SCCAB):** Covers Ventura County and is within the jurisdiction of the Ventura County Air Pollution Control District (VCAPCD).
- **The Mojave Desert Air Basin (MDAB):** Covers the desert portions of Los Angeles, Riverside, and San Bernardino counties. A small portion of this air basin is in Kern County and outside of the SCAG region. The SCAG portion of this air basin is under the jurisdiction of three air districts:
    - The Mojave Desert Air Quality Management District (MDAQMD) administers portions of the MDAB situated in San Bernardino County and eastern Riverside County. The Riverside County portion is known as the Palo Verde Valley Area.
    - The SCAQMD administers the portion of MDAB in Riverside County situated between the Salton Sea Air Basin (SSAB) and the Palo Verde Valley Area.
    - The Antelope Valley Air Quality Management District (AVAQMD) administers the Los Angeles County portion of the MDAB.
- **The Salton Sea Air Basin (SSAB):** Covers all Imperial County and the eastern desert portion of Riverside County (excluding the MDAB portion). This air basin is under jurisdiction of two air districts:

Map of Air Basins



Working Draft

Map of Air Districts



- The Imperial County Air Pollution Control District (ICAPCD) administers the Imperial County portion of the SSAB.
- The SCAQMD administers the Riverside County portion of the SSAB situated between the SCAB and the MDAB.

The Growth Conundrum

Although the ARB and the SCAQMD have blazed a trail in the effort to improve air quality, growth in the SCAG region has resulted in one of the most polluted areas in the nation and continued violation of federal and state ambient air quality standards.

The SCAG region is the largest metropolitan planning area in the United States, encompassing 38,000 square miles. The region is divided into 14 subregions and has one of the largest concentrations of population, employment, income, business, industry and finance in the world.

The six-county SCAG region is home to more than 18 million people, nearly half of the population of the state of California. The Gross Regional Product (GRP) for the region, over $700 billion in 2005, represents the 10th largest economy in the world. Consequently, the SCAG region faces an exponentially growing population coupled by significant economic growth. The SCAG growth forecast reveals that regional population is projected to increase by almost 5.8 million people (32%), from 2003 to 2035, employment by 2.5 million jobs (32%), and the number of households by 2.0 million (35%).[8]

In the face of continued population growth, sprawling urbanization, increasing annual vehicle miles traveled, and an expanding economy, air quality has suffered. Balancing projected growth and environmental health presents a significant challenge for SCAG and other stakeholders.

Accommodating the anticipated growth in the SCAG region in a sustainable way—by taking account of ecological, economic and social factors, while enhancing quality-of-life indicators for present and future generations—represents the central challenge facing regional transportation planning in Southern California.

The Growth in Goods Movement

Southern California faces an extraordinary economic opportunity and a frustrating policy dilemma. Goods movement in the SCAG region is supported, in part, by its geographical advantage such as deep-water marine ports and highly developed network of highways and railways, availability of trans-loading facilities and its large internal market. The region is a major gateway for both international and domestic commerce, and goods movement is the fastest growing segment of the region's transportation sector. Additionally, goods movement plays a vital role in the national, state, and regional economies with one out of every seven jobs in Southern California depending on trade.

The Ports of Los Angeles and Long Beach together handled over 14 million Twenty-Foot Equivalent Units (TEUs) in 2005which accounted for 24% of all U.S. export container traffic and 41% of import container traffic. The combined ports are ranked the fifth largest container port complex in the world, with approximately 40,000 TEUs moving every day through the complex. The San Pedro Bay ports are projected to continue to maintain their strong position in the future in accounting for majority of the containerized trade moving through California. The current forecast predicts the containerized trade volume to triple to approximately 43 million TEUs in 2030.

Given the projected growth in goods arriving at the Port of Los Angeles and Long Beach, as well as projected regional population growth, both freight rail service and passenger service are expected to increase. The SCAG Heavy Duty Truck model projects truck vehicle miles of travel (VMT) will increase by over 110% by 2030, growing from a level of over 22 million VMT in 2000 to over 48 million VMT by 2030.

The increasing volume of goods moving in and through the SCAG region is straining the existing infrastructure and exacerbated air quality challenges. The projected growth in truck volumes and increase demand on the existing railroad capacity will bring with it associated concerns of automobile traffic delays, safety concerns, and air quality violations, thus, compromising the quality of life, health and safety of the residents and communities in the region.

Air Quality Strategy

Policy makers and regulatory agencies, alike, have begun to realize the daunting air quality challenges the region faces. Recognizing the need for immediate action, on May 2007, SCAG's Regional Council, which is comprised of elected officials throughout region, adopted a resolution urging the federal and state governments to take emergency responses in the face of an air quality health crisis. The call to action was in response to the fact that: 1) the residents of the South Coast Air Basin experience over 5,000 premature deaths annually due to exposure to $PM_{2.5}$, 2) the residents of the South Coast Air Basin comprise over 50% of the population in the nation that is exposed to $PM_{2.5}$ concentrations above the federal standard; 3) the Draft 2007 AQMP for the South Coast Air Basin identified a shortfall of over 70 tons per day of NO_x reductions to meet the federal $PM_{2.5}$ standard by the 2015 CAA deadline; and 4) a substantial portion of the emissions come from federal and state sources.

Subsequently, the ARB and SCAQMD worked to find additional emission reductions from already proposed measures or new measures to help meet the $PM_{2.5}$ air quality standard. In September 2007, Board representatives from ARB and SCAQMD, and Regional Council representatives from SCAG, reached an agreement on emission reduction measures needed to meet the $PM_{2.5}$ deadline in 2015.

Specifically relevant to cities and counties is a measure to achieve additional NOx reductions through the funding of SIP-creditable projects from air quality-related motor vehicle registration fees collected in the South Coast Air Basin (i.e., AB2766 funds) (SIP credit is not currently taken for projects funded with these fees.) South Coast cities and counties should target their air quality funds to get the most cost-effective emission reductions. ARB will amend its guidance on the use of the fees to include new cost-effectiveness guidelines and a suggested list of SIP-creditable projects. SCAG will work with ARB and the SCAQMD to develop guidance and to educate and inform cities and counties of this effort.

Additionally, SCAG will continue, through its RTP process, to attempt to identify transportation infrastructure measures that will achieve quantifiable reductions such that such reductions could be used to substitute for other SIP commitments.

Further, the three agencies (i.e., ARB, SCAQMD, and SCAG) acknowledge that significant efforts will be needed to identify specific control measures or strategies/mechanisms to achieve the emission reductions associated with the long-term ("black box") measures to achieve the 8-hour ozone standard by 2024 and other

future air quality standards. Thus, the three agencies are committed to work together to develop a discussion paper which explores potential new or transformative strategies, such as state-of-technology zero and near-zero transportation systems, other mechanisms such as fee-based incentives, and availability of public funding assistance programs.

THE PLAN

This chapter neither replaces nor modifies the air plans adopted within the region, but rather, it sets the policy context in which SCAG participates in and responds to these plans and their implementation. The RCP builds off the Air Quality Management Plan (AQMP) process that is designed to meet federal and State health-based criteria pollutant standards. First, it complements the AQMP by providing guidance and incentives for public agencies to adopt best practices that support the technology-based control measures in the AQMP. For example, the RCP's energy policies will help accelerate turnover of older, more polluting power plants and generators that reduces emissions from these point and area sources of pollution. Second, the RCP emphasizes the need for local initiatives that can reduce the region's greenhouse gas emissions that contribute to climate change, an issue that is largely outside the focus of the AQMP. Policies that reduce our "carbon footprint" can have direct impacts on energy, water supply, and other resource areas. Third, the RCP emphasizes the need for better coordination of land use and transportation planning, which heavily influences the emissions inventory from the transportation sectors of the economy.

The RCP calls on SCAG and local governments throughout the region to implement policies that complement the AQMP in the following ways:

- **SCAG**: As the Metropolitan Planning Organization for Southern California, SCAG has a defined role in developing the transportation control measures (TCMs) for the AQMP. This can include new TCMs that help reduce the region's "black box" of undefined emission reductions. In its role as a Council of Governments, SCAG can influence a local jurisdiction's actions by providing guidance on policies that address criteria pollutants, greenhouse gases, and public exposure to toxics and other pollutants of concern. It can also prioritize funding for planning and/or transportation projects to projects that are most consistent with the RCP's policies. Finally, as the authorized regional agency for Inter-Governmental Review of Programs proposed for federal financial assistance, SCAG can be a regional clearinghouse for data, funding information, program coordination, and recommend that issues at the project or General Plan level be addressed to ensure consistency with the RCP.
- **Local Governments**: Cities and counties can amend general plans to implement land use, energy, transportation, and other policies that reduce their carbon footprint consistent with State law. In addition, local governments can use their land use authority to properly buffer residences and other sensitive land uses from freeways, industrial activity centers, and other sources of toxics or ultrafine particulates.

Continuing the trend toward attainment of clean air standards will be difficult given the pace of population growth, freight activity from our sea and airports, and increasing congestion from a transportation system with limited opportunities to expand roadway capacity and a heavily-subsidized public transit system. The new and revised proposed actions require a collaborative effort from

federal, state, and local government in order to meet the air quality targets.

Striking a balance between economic and environmental objectives is a daunting task. Much more work will be needed to achieve healthful air for all Southern Californians. As such, collaborative efforts undertaken by various federal, state, and local regulatory agencies are necessary in overcoming this challenge. The goals, outcomes, and action plan of the RCP Air Quality Chapter aims to coordinate these various activities to help the region develop strategies that utilize the most effective technologies, transportation investments, urban design strategies, which reduce air pollution, improve air quality, and protect human health and the natural environment.

AIR QUALITY GOALS

- Reduce emissions of criteria pollutants to attain federal air quality standards by prescribed dates and state ambient air quality standards as soon as practicable.
- Reverse current trends in greenhouse gas emissions to support sustainability goals for energy, water supply, agriculture, and other resource areas.
- Minimize land uses that increase risk of adverse air pollution-related health impacts from exposure to toxic
- air contaminants, particulates (PM_{10}, $PM_{2.5}$, ultrafine), and carbon monoxide.
- Expand green building practices to reduce energy-related emissions from development.

AIR QUALITY OUTCOMES

- Attain the federal 8-hour ozone standard by the dates specified in the 2007 AQMPs for the respective non-attainment areas:
    - South Coast Air Basin by 2024
    - Coachella Valley by 2019
    - Antelope Valley and Western Mojave Desert (to be determined by ARB by fall 2007)
    - Ventura County (to be determined by ARB by fall 2007)
    - Imperial County by 2007
- Attain the federal $PM_{2.5}$ standards in the South Coast Air Basin by 2015.
- Reduce the region's greenhouse gas emissions to 1990 levels by 2020.
- Amend local government General Plans to limit future growth of residences and other sensitive receptors near major sources of toxic air contaminates and other hazardous air pollutants (e.g., freeways, railyards, and industrial facilities).
- All cities in the region adopt green building standards by 2012.

AIR QUALITY ACTION PLAN

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Policies															
x			AQ-1 Implement control measures from local Air Quality Management Plans (AQMPs)		x	x							x	x	x
x			AQ-1.1 SCAG shall ensure that transportation plans, programs, and projects are consistent with State air quality plans for attaining and maintaining the health-based National Ambient Air Quality Standards (NAAQS).		x	x							x	x	x
x			AQ-1.2 SCAG shall ensure compliance with the Transportation Conformity Rule, including the new air quality standards for fine particulate matter ($PM_{2.5}$) and 8-hour Ozone.		x	x							x	x	x
x			AQ-1.3 SCAG shall ensure that there is continued development of Transportation Control Measures (TCMs) in the South Coast Air Basin (SCAB).		x	x							x	x	x
x			AQ-2. Identify new SIP control strategies that reduce the amount of undefined emission reductions necessary to reach attainment.		x	x					x		x	x	x
		x	AQ-2.1 SCAG, in conjunction with the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (ARB), local air districts, and other stakeholders, shall develop consensus on how to identify		x	x					x		x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			discrete control measures that replace the undefined reductions in attainment plans.												
x			AQ-3. Support and pursue environmentally sustainable strategies that implement and complement climate change goals and outcomes.		x	x		x		x	x		x	x	x
x			AQ-3.1 SCAG, in conjunction with stakeholders, will develop policies that support the greenhouse gas goals set forth in the Global Warming Solutions Act of 2006 (AB 32), which requires a reduction in global warming emissions to 1990 levels by 2020.		x	x		x		x	x		x	x	x
x			AQ-3.2 SCAG will participate in the development of rules to implement ARB's Group 1 "discrete early action greenhouse gas reduction measures." These include the proposed Low Carbon Fuel Standard, reduction of refrigerant losses from motor vehicle air conditioning maintenance, and increased methane capture from landfills.		x	x		x		x	x		x	x	x
x			AQ-3.3 SCAG will participate in the development of ARB's Group 2 non-regulatory activities and greenhouse gas regulations that will be enforceable after January 1, 2010, including electrification, phase two vehicle standards, and more		x	x		x		x	x		x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			refrigerant controls.												
x			AQ-3.4 SCAG will participate in the development of ARB's Group 3 "traditional control measures" aimed to reduce criteria and toxic air pollutants which have concurrent climate co-benefits.		x	x		x		x			x	x	x
x			AQ-3.5 SCAG will provide assistance to local governments on how to address climate change issues in General Plan updates.	x	x	x		x		x			x	x	x
x			AQ-4 Develop policies that discourage the location of sensitive receptors that expose humans to adverse air quality impacts.	x	x	x				x			x	x	
x			AQ-4.1 SCAG shall assist local governments develop policies that minimize exposure of sensitive receptors and sites (e.g. schools, hospitals, and residences) to major sources of air pollution, including diesel particulate matter emissions, such high-traffic freeways and roads, rail yards, ports, and industrial facilities.	x	x	x				x			x	x	
x			AQ-5 Practice and promote sustainable building practices.	x		x	x	x		x		x	x	x	x
x			AQ-5.1 SCAG shall disseminate information about energy efficiency and green building programs and energy use reduction, such as the EPA's Energy Star Program, the South	x		x		x		x					x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			Coast Air Quality Management District's (AQMD) Equipment Exchange Program, and U.S. Green Building Council's (USGBC) LEED Program through the SCAG web site, web links to other programs, and educational workshops and presentations.												
		x	AQ-5.2 SCAG shall adopt a policy to strive for carbon neutrality for its own facilities and operations.	x	x	x		x		x		x			x
x			AQ-5.3 SCAG shall utilize its Intergovernmental Review (IGR) process to recommend utilization of green building practices as potential mitigation measures.	x		x	x	x		x		x			x
		x	AQ-5.4 SCAG, shall engage both private and public sectors to assist local government in the creation of green business certification program for businesses that want to reduce energy usage.			x		x		x					x
Local Government Policies															
x			AQ-6 Implement control measures from local Air Quality Management Plans (AQMPs)		x	x		x		x			x	x	x
x			AQ-6.1 Local governments should accelerate turnover of older, more polluting mobile and stationary source equipment.		x	x		x		x			x	x	x
x			AQ-7 Support and pursue environmentally sustainable strategies that implement and		x	x		x		x			x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			complement climate change goals and outcomes.												
x			AQ-7.1 Local governments should update their General Plans to address the requirements of AB 32. This should include an inventory of 1990 emissions of greenhouse gases and a strategy for reducing 2020 emissions to those levels.			x		x		x			x		x
x			AQ-8 Develop policies that discourage the location of sensitive receptors that expose humans to adverse air quality impacts.	x	x	x				x			x	x	
x			AQ-8.1 Local governments should amend General Plans, zoning ordinances, business licensing, and related land use permitting processes to minimize human health impacts from exposure of sensitive receptors to local sources of air pollution. Jurisdictions should consider applicable guidance documents, such as ARB's *Air Quality and Land Use Handbook: A Community Health Perspective* and the South Coast AQMD's *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning*.	x	x	x				x			x	x	
x			AQ-9 Practice and promote sustainable building practices.								x				

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
x			AQ-9.1 In updating their General Plans and/or zoning ordinances, local governments should adopt policies that promote the use of green building practices, which include incorporating LEED design standards and utilizing energy efficient, recycled-content and locally harvested or procured materials.	x	x	x		x		x			x		x
x			AQ-9.2 Local governments should develop incentive programs (e.g. density bonuses) to encourage green building and resource and energy conservation in development practices.	x	x	x		x		x			x	x	x
x			AQ-9.3 Local governments should adopt policies that strive for carbon neutrality for their own facilities and operations.	x	x	x		x		x		x			x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Initiatives															
		x	AQ-SI1 SCAG shall work with federal, state, and local stakeholders to identify long-term innovative strategies that can achieve significant emissions reductions from the transportation system, including transformative goods movement strategies.	x	x	x		x		x			x	x	x

[1] http://lungaction.org/reports/sota07_cities.html
[2] Avol, Ed. SCAG State of the Region Guest Essay: The Greater Los Angeles Region: Maybe Not Perfect…But In Crisis? (2007)
[3] Ibid.
[4] Ibid.
[5] http://www.aqmd.gov/aqmp/07aqmp/draft/AppI.pdf
[6] http://content.nejm.org/cgi/content/abstract/329/24/1753
[7] http://www.aqmd.gov/aqmp/07aqmp/draft/AppI.pdf
[8] http://www.aqmd.gov/aqmp/AQMPintro.htm
[9] 42 U.S.C §§7401 et seq.
[10] Cal. Health and Safety Code §§40910 et seq.
[11] CARB, *Proposed Emission Reduction Plan for Ports and Goods Movement in California*, March 2006.
[12] http://www.arb.ca.gov/planning/sip/2007sip/revcasip2007.pdf

Economy

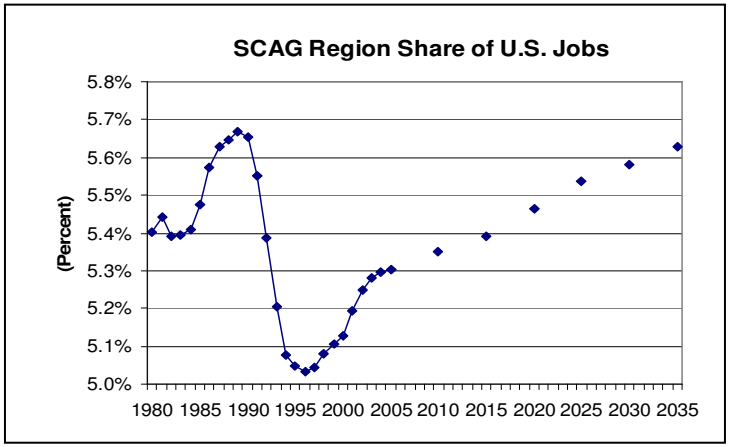
THE CHALLENGE

While the SCAG region has a strong economic base with several sectors poised for growth in jobs and wages, successful policy actions are needed to ensure the regional economy adds the projected 3 million jobs between 2005 and 2035.

In the early 1990's, the region experienced a severe recession led by downturns in aerospace and construction jobs. The region's share of U.S. jobs fell from near 5.7% in 1990 to just above 5.0% in 1995. The SCAG region has outpaced the nation in job growth since 1995 and the region's share of U.S. jobs rose steadily to 5.3% in 2005.

Jobs in the region are projected to continue to increase faster than the national growth rate and by 2035 the SCAG region is projected to capture 5.6% of U.S. jobs, still slightly below the high level of 1990.

Sectors like international trade; architectural and design services; tourism and entertainment; technology and the nation's largest manufacturing complex give the region a good head start on developing a prosperous economy over the next 30 years. The projected job growth will provide a wide range of job opportunities for residents while requiring additional workers at all skill levels.



The projected job and income growth will not come automatically. Job growth and the chance for broadly shared prosperity depend on meeting a number of substantial economic challenges.

Improving the Economic Competitiveness of Key Sectors

In this increasing globalized economy, regions compete for the location of industries that export goods and services across not only their own country but around the world. The SCAG Region faces challenges in providing the infrastructure to support local, national, and international goods movement as well as providing for the mobility needs for the rest of the economy. Such investments must also occur within a context of environmental quality, justice and respect for local communities.

Moreover, the region must increase its share of employment in those industries and service sectors where wages and salaries will be higher than average and where growth, nationwide and internationally, is expected to be strong (e.g. professional, business and information services, wholesale trade and transportation services, tourism and entertainment sectors, and high technology and green technology sectors). It should also include industries with a defined career ladder that do not necessarily require advanced education (e.g. logistics). At the same time that it pursues growth in these sectors, the region must maintain a sufficiently diverse economic base overall and sufficient local, self-reliancee, so as protect against over-dependence upon any few industries or

income streams and help insulate the regional economy from global downturns.

Education and Workforce Challenges

A skilled workforce is fundamental for turning economic opportunities into successful outcomes for residents and the region. Attracting, retaining, educating and training a diverse, skilled labor force has become an increasingly important objective for regional economies. The ability to attract workers (and firms) is dependent upon the livability and quality of life for the region, its business climate, and working conditions. Investments in these areas are critical for the SCAG region. The region is facing a draft shift in its labor force as the baby boomers retire and are replaced, in large part by immigrants and their children and grandchildren, who come with a relatively lower level of educational achievement than much of the region's existing labor force. Improvement of the region's educational system as well as training opportunities for adult workers is critical.

Economic Growth Must be Consistent With Regional Environmental, Health, Mobility and Social Justice Goals

International trade can create good job opportunities and raise real income levels for the SCAG region. To benefit from the growth in international trade expected, while remaining globally competitive, significant investment is necessary to improve the efficiency and expand the capacity of the region's goods movement infrastructure. Such changes must also occur within a context of environmental quality, environmental justice and respect for local communities.

Needed improvements in the region's goods movement infrastructure depend upon cooperation between government and the private sector. Public investment and planning can play a strong role in attracting needed additional private investment. At the same time, improvements to the goods movement system should not come at the expense of other transportation system investments, nor should they be only the burden of local, regional or state government.

Given current limits on local and state finances, innovative methods will be needed to procure and pay for these system improvements. Both the federal and State governments must act to support innovative procurement and public-private funding mechanisms, and should take legislative action to allow the region to pursue innovative funding strategies. The national purpose served by Southern California's goods movement system also points to the need for strong federal participation in assisting the region with the substantial local burdens it bears in serving this role - including traffic congestion, air pollution, noise, public health impacts, visual blight, and freight-related safety incidents. These burdens are not compensated, thus forming an effective subsidy for lower-priced goods in other states. The federal government should explore ways to compensate the region for the services it provides.

Quality of Life

Quality of life is an economic competitiveness challenge. The key quality of life challenges for the SCAG region are mobility, air quality and housing. Recent trends in housing prices and affordability raise serious challenges for the region in attracting and retaining industries that offer good jobs. Although housing is discussed extensively elsewhere in the Regional Comprehensive Plan, it is important to remember that housing is a challenge to future regional prosperity.

THE PLAN

A bold new strategy is needed, based upon the Growth Visioning/Compass principles of mobility, livability, prosperity and sustainability, to promote a healthy, competitive and flourishing economy for the SCAG region. In order to satisfy the Growth Visioning/Compass principles, polices must be developed that enable business to be profitable and competitive regionally, nationally and internationally. Policies must also ensure sufficient growth in employment and incomes to alleviate poverty and meet the basic needs of all the people who participate in our economy.

The region's economic viability and attractiveness depend upon mutually supportive economic development strategies, land use decisions, transportation investments, and educational improvements. These include:

- Focusing development in urban centers, existing cities and along (existing and future) transportation corridors
- Providing housing to meet the needs of all income levels
- Locating new housing near existing jobs and new jobs near existing housing
- Designing/building 'green' to save resources, reduce costs and increase competitiveness
- Doing this while ensuring environmental justice
- Developing a well-educated work force
- Fiscal and governmental policies that support these approaches

The comprehensive strategy to meet these challenges needs to address the physical, economic, environmental and human capital dimensions. In addition, such a strategic vision will only succeed if government agencies, the private sector, non-profit organizations and the region's residents all embrace it. Only with the participation and cooperation of all the region's stakeholders will this vision be realized.

The Green Economy

Environmental quality and economic growth can go hand in hand. Promoting clean energy and jobs have been found to have a positive impact on the economy.

A study by the Economic Policy Institute found that a policy package including a modest carbon/energy tax, development of new energy-efficiency and renewable energy technologies, and transitional assistance to compensate any workers and communities harmed by the policies would reduce U.S. carbon emissions by 27% in 2010 and by 50% in 2020 and increase GDP increase by a modest 0.24% in 2010 and by 0.6% in 2020, and add an additional 660,000 net jobs would be created in 2010, 1.4 million in 2020.[1]

In addition, a report, "Economic Growth and Greenhouse Gas Mitigation in California," offered an independent assessment of the economic impacts of AB 32. This study conducted by the University of California, Berkeley, and delivered to the state legislature on August 16, 2006, found that returning California greenhouse gas emissions to 1990 levels by 2020, as identified in AB 32, can boost the annual Gross State Product (GSP) by $60 billion and create 17,000 new jobs by 2020. The study found that the gains could be up to $74 billion in annual GSP and 89,000 new jobs by 2020 - if climate policies are designed to create direct incentives for California companies to invest in new technology.[2]

ECONOMY GOALS

- Position the SCAG region and its economy to seize opportunities and address challenges that will enhance the region's mobility, livability, prosperity, and

sustainability.

- Enable business to be profitable and competitive (locally, regionally, nationally, and internationally).
- Promote an economy that rewards hard work, perseverance, and ingenuity to allow individuals and families to achieve a better quality of life.
- Ensure that the maximum possible number of residents participate in growth of prosperity in the SCAG region. (*Note that a goal of broadly shared prosperity does not imply a strategy of redistributing today's income. Strategies to ensure that future economic gains are broadly distributed are based, by contrast, on expanding opportunity and the commitment of business and government leaders to recognize that individuals and communities left behind today must be made full partners in the growth of tomorrow's economy*.)
- Ensure a healthy, flourishing economy that provides sufficient employment opportunities to decrease poverty and meet the basic needs of all the people who participate in our economy by:
    - Promoting education and workforce training policies that give residents an opportunity to compete for the full range of jobs available with good wages and benefits;
    - Encouraging and enabling charities and non-profits to help provide for the poorest in our region;
    - Achieving economic development while being consistent with the region's sustainability goals for land use, air quality, and other resource areas; and
    - Accomplishing this within an ecological and sustainable context that uses resources wisely.

ECONOMY OUTCOMES

- Increase job growth to add three million jobs to the regional economy by 2035.
- Eliminate gaps in educational achievement between different racial and ethnic groups by 2035.
- Increase the real per capita income to restore 1997 levels of household and individual purchasing power.
- Expand green technologies and employment above and beyond Title 24 requirements by 2035.
- Increase the region's economic vitality and attractiveness by focusing housing and job additions in urban centers, employment centers, and transportation corridors, such that there will be a minimum of 35% of the region's household growth and 32% of employment growth in these areas from their levels in 2005 by 2035.
- Increase the affordability of health care by 50% to reduce losses in productivity resulting from inaccessible health care.
- Promote sustained economic health through diversifying the region's economy, strengthening local self-reliance and expanding global competitiveness.

ECONOMY ACTION PLAN

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Policies															
		x	EC-1 SCAG shall form an active Prosperity Partnership, a coalition of public and private entities, dedicated to developing and implementing a common economic strategy for the SCAG region.							x					
		x	EC-2 SCAG shall partner with institutions that will help develop global trade logistics infrastructure needed for local businesses to remain competitive.	x	x					x					
		x	EC-3 SCAG shall partner with economic development organizations to assist the region in attracting and retaining both local and foreign investment.	x						x					
		x	EC-4 SCAG, in collaboration with local jurisdictions, shall increase awareness - both private and public sectors - of efforts currently underway supporting industry cluster formation in our region.	x	x			x		x					
		x	EC-5 SCAG shall encourage regional universities and business schools to explore opportunities to maximize benefits to the region from public dollars.							x					

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
		x	EC-6 SCAG shall inform stakeholders (workforce boards, community colleges and businesses) about the long-term demographic and workforce trends in the SCAG regional forecast.	x						x	x			x	
		x	EC-7 SCAG in partnership with local governments shall support K-12 education programs, particularly for at-risk students that help improve high school graduation rates and increase opportunities for all qualified students to attend and graduate from college.	x						x				x	
		x	EC-8 SCAG and local jurisdictions shall partner with workforce boards and community colleges in identifying specialized training courses that: • Meet current and future job needs. • Upgrade technological skills and open up career opportunities of adult and young workers. • Assist people adapting to change.	x						x					x	
		x	EC-9 SCAG, state agencies and local jurisdictions, should support programs that connect school district databases region-wide to track and assess student performance to better ensure a match between education and skill requirements and attainment.	x						x					x	

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
		x	EC-10 SCAG shall develop a suite of technologies or a renewable portfolio of services that allow the SCAG region to plan for a greener, more sustainable economy.	x	x	x	x	x	x	x		x	x	x	x
		x	EC-11 SCAG shall actively engage environmental stakeholders to promote efficiencies, conservation, and renewable energy resources by working with the business sector and government agencies, such as the California Center for Sustainable Energy, the state's Environmental Agency (Cal-EPA), the California Transportation Commission, and others.	x	x	x	x	x	x	x		x	x	x	x
		x	EC-12 SCAG shall partner with organizations that promote the creation of new advanced, environmental friendly, sustainable technologies for all sectors in the region's economy.	x	x	x	x	x	x	x		x	x	x	x
	x		EC-13 SCAG shall continue efforts to leverage state infrastructure bond financing to our region to implement the enormously challenging goods movements and transit oriented development infrastructure.	x	x	x		x	x	x		x	x	x	x
		x	EC-14 SCAG, in collaboration with state agencies and local governments, should support programs that develop workforce in	x	x	x	x	x	x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			the green technology sector.												
		x	EC-15 SCAG shall explore means of improving housing availability and pricing. Affordable housing shortage is compounding the difficulty for emerging industries to attract and retain demand positions, which are mostly the younger, more recently educated work force. Similarly, it also adds to the difficulties in attracting and retaining employees from other areas.	x	x	x		x	x	x	x		x	x	

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Initiatives															
		x	ECSI-1 SCAG, in collaboration with state agencies and local governments, should promote the region's livability and quality of life, along with its business climate and working conditions by support investments in attracting, retaining, educating and training a diverse, skilled labor force necessary to attract workers and firms.	x						x				x	
		x	ECSI-2 SCAG, in collaboration with state agencies and local jurisdictions, shall promote and support regional policies that: • Promote sustainable economic development, within an ecological context, that uses resources wisely and sustainably and builds sustained economic health. • Reward local ingenuity, initiative, enterprise and creativity. • Give local governments the flexibility to attract needed businesses and jobs into their communities without compromising social or environmental standards. • Promote fiscal reform at the state, county and local level (involving sales, property and income taxes) to meet the regions capital investment needs of the region's	x	x	x	x	x	x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			economy. Reform must address increasing local control over school and transportation funds and de-emphasize local dependence on sales tax revenues. Overall, tax systems should be diverse enough to protect against over-reliance upon any small number of income streams. • Work with industries to diversify their industrial bases. • Help local firms replace jobs that cannot be retained. • Expand employment in existing high-wage service-sector firms. • Foster growth of small and medium-sized, locally-based firms													
		x	ECSI-3 SCAG and local jurisdictions shall support development of workforce strategies that upgrade skills and open up career opportunities for adult workers who need to adapt to change.	x						x				x	
		x	ECSI-4 SCAG in partnership with local jurisdictions shall support an increase in opportunities for immigrants to learn English at convenient times and locations	x						x				x	

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
		x	ECSI-5 SCAG, in collaboration with state agencies and local governments, shall encourage industries to incorporate more energy efficient resources into their products.	x	x	x	x	x	x	x		x	x	x	x
		x	ECSI-6 SCAG and local jurisdictions shall support efforts to increase employment in green, sustainable technologies and/or related industries.	x	x	x	x	x	x	x		x	x	x	x
		x	ECSI-7 SCAG shall promote the implementation of the Southern California Regional Strategy for Good Movement Action Plan, which is based on three principles: • International trade can create good job opportunities and raise real income levels for the SCAG region. To benefit from the growth in international trade expected, while remaining globally competitive, significant investment is necessary to improve the efficiency and expand the capacity of the region's goods movement infrastructure. Such changes must also occur within a context of environmental quality, environmental justice and respect for local communities. • Improvements to the goods movement system should not come at the expense of	x	x	x		x		x			x	x	x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			other transportation investments nor should improvements by only the burden of local, regional or state government. • Investments in the regional goods movement system should be made to realize regional benefits that have statewide implications												
		x	ECSI-8 SCAG in collaboration with state agencies and local governments, should support policies such as: • Market-based emissions trading programs that use a cap with progressive reductions of the cap overtime. • Legislation that promotes "green building" through a mixture of regulation and incentives. • Clean air plans that reduce port-generated pollution from airplanes, vessels, trains, trucks and terminal operating equipment by 45% over the next five years.	x	x	x	x	x	x	x		x	x	x	x
		x	ECSI-9 SCAG in collaboration with state agencies and local governments should support policies that streamline the permit process and regulatory requirements imposed upon developers so as to eliminate excessive review time, cost and inefficiency.	x						x					

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
		x	ECSI-10 State agencies and local governments should reform the state-local government fiscal relationship to help achieve sound, sustainable development. If government is going to "incentivize" the behavior of its governmental institutions, the incentive needs to be in line with its overall goals and objectives (e.g. making affordable workforce housing available). Local jurisdictions working through their representative advocacy groups (e.g. the League of National Cities) need to work with the state to balance the "fiscalizations" of the land use impacts, moving towards making cities fiscally ambivalent over using land for retail or housing purposes.	x					x	x					

[1] Barrett, James P. and J. Andrew Hoerner. Economic Policy Institute. Clean Energy and Jobs: A comprehensive approach to climate change and energy policy. (2002).
[2] Roland-Holst, David. Economic Growth and Greenhouse Gas Mitigation in California. August 16, 2006.

Education Essay

Report Presented By

Overview

By the year 2020, California's population of 33 million is projected to reach 45.3 million, an increase of 37 percent. At the current rate, the state is adding nearly 4 million people, or the equivalent of the population of Los Angeles, every seven years. Pressures of growth are taxing the physical infrastructure. State mandated reforms in educational practices, including bold measures like class size reduction, have created the need for more and better educational facilities. Poor planning decisions are stretching other forms of public infrastructure to the limit and draining economic vitality from cities and towns. A new framework is needed by which current programs, procedures and policies developed at every level of state, regional and local governance can coalesce to address these challenges with smarter strategies for planning, investment and implementation.

Smarter planning for education means siting and designing schools that serve as centers of their communities, a concept endorsed by the U.S. Department of Education and leading national educational facilities planning organizations. The concept calls for gymnasiums and play fields that double as community open space and recreation centers; auditoriums that serve as community theatres and meeting venues; and incorporating centralized libraries, health information clinics and other community services into school facilities that are designed for greater parent and community access and engagement. Schools designed as the vital centers of community can also leverage a wide range of community resources – such as museums, zoos, and other existing facilities - to create integrated learning centers.

Developing joint-use schools that serve as centers of their communities is a concept that also has implications for the so-called "smart growth" strategies for urban and regional planning. Over the past thirty years, California's growth pattern has consumed tremendous quantities of land for sprawling low-density development, with the car and its attendant infrastructure – streets and highways, street parking, and parking lots – taking up at least a third of all developed land. This strategy for accommodating growth also produces more traffic congestion and loss of productivity; air pollution and its environmental and public health impacts; the loss of open space; the inability of many to reach jobs and services; and the isolation of children from the elderly among other social and environmental problems.

Need for Joint-Use Community-Centered Development

Families with infants, young children and little economic means are seriously challenged in Los Angeles County. The wages and formal education of these children's parents often fall well below minimal standards required for daily living, not to mention advancing family opportunities. Public schools experience severe overcrowding and, along with their neighborhood public parks, have physically deteriorated with lack of maintenance and the impacts of gangs and crime. These low-income families have inadequate access to day care, early childhood education facilities, family resource centers and health clinics. The housing available in their communities often is in substandard condition. Compounding these community

deficits, older inner-city and inner-suburban neighborhoods of the Los Angeles Basin have little available open land and, until very recently, have lacked the investment capital necessary to build new infill housing, preschools, day care, pocket parks, branch libraries and the community amenities that help revitalize neighborhoods and nurture the families who make up those neighborhoods.

Studies conducted by both UCLA's Center for Healthier Children, Families, and Communities and The Advancement Project, a policy action group based in Los Angeles, confirm that deteriorating schools and neighborhoods disproportionately affect the life prospects and school readiness of poor children living in inner-city communities and in low-income suburban enclaves. More specifically, the physical and social health of entire neighborhoods remains at risk when the institutions that we expect to educate and support children have been relegated to second- and third- rate status in our communities.

Two seminal reports published in January 2007 further highlight the current pressing need for broader community development opportunities:

- The Advancement Project's "Citywide Gang Activity Reduction Strategy: Phase 3 Report" documents the impact of gang violence for the past 20 years in Los Angeles. Specifically, this report advocates that "comprehensive, neighborhood-based, school centered-strategies for effective prevention, intervention, and community development will be needed in order to…pull 'sliding communities' with emerging violence back to safety and keep safe areas safe." This study concludes that the solutions to the gang crisis in Los Angeles "require cross-silo creativity, bold leadership, smart strategy, and sustained focus."
- Mayor Antonio Villaraigosa's report entitled "The Schoolhouse Framework" illustrates the need for new and innovative ideas for realizing a great public education for every child in Los Angeles. Specifically, the Mayor's report calls for schools to be "neighborhood centers" with strong family and community involvement. The Mayor proposes that this "neighborhood centered" model support schools by establishing relationships with a broad range of partners including parent groups, local businesses, health care agencies, libraries, parks, and others

Neighborhoods in greatest need of new school facilities often have populations of families with young children in need of, but without access to, health insurance and resources for adequate prenatal, primary and preventive medical care. A few schools in the Southern California region have experimented with locating early childhood education facilities, health care, family resource centers and social service providers on or adjacent to school campuses, and the results are encouraging. But these efforts are too rare and have failed to date to transform what pilots exist into school district policy. Too often they are one of a kind feats of leadership and personal tenacity occurring despite institutional disincentives. Failing to build our public schools, especially in poor communities, as mixed-use, family resource centers, as holistically integrated centers of community learning, not only is fiscally inefficient, but also places the core principles of equity and justice at risk.

Challenges of Joint-Use Community-Centered Development

One of the largest statewide expenditures in public infrastructure goes to building and maintaining public schools. Public K-12 school enrollment has more than

tripled in the past 50 years. The estimated growth in student enrollment is approximately 50,000 students annually. New enrollment records will continue to be set for the next nine years, increasing to an estimated 6,180,921 students in K-12 public schools by the 2007/2008 school year. This constitutes a total increase of 547,275 students, or 10 percent between 1997 and 2007. This estimate includes a decrease of 345,193 Anglo students and an increase of 800,000 Hispanic students, indicating the current and continuing demographic trend toward greater diversity, but, in part, also the decision of many Anglo parents to leave the public school system.

The renovation and replacement of educational facilities is currently in a state of crisis. It can take up to seven years to run the gauntlet of local and state approvals and procedures before a school is ready to serve its constituents. As a result, school boards and building officials are working hard to get facilities on line faster. Larger and larger schools are being built in an attempt to address the problem. In an attempt to save time and money, districts are sometimes forced to replicate building plans that are outdated with respect to current educational research and teaching strategies. In most cases, projects move forward without much involvement from students, parents, educators and community members, all who have a long-term stake in the outcome. The result is often community alienation, disenfranchisement or even backlash.

There is a woefully inadequate allocation of time and money for planning how schools will fit into their communities; how the efficiencies of building larger and larger schools may not be justified in light of critical social and educational consequences; how combining school and community uses could produce more efficient and community centered environments for learning; or even for adequately identifying risk factors like building on toxic waste sites and other environmental hazards that can lead to mistakes at a scale that would have once been considered unimaginable.

The current need to renovate or replace educational facilities presents an opportunity for citizens, educators and planners to take a much smarter view of the design of learning environments. This "smarter" view can include everything from how learning spaces are designed to the process used to plan and design them. More traditional educational facilities were once designed to sustain a model of education characterized by large-group, teacher-centered instruction occurring in isolated classrooms. But current knowledge and research about learning calls for new models. These new models of education are characterized by more active student involvement - by students doing rather than just receiving, creating rather than recreating, thinking, working and solving problems. They are supported by strategies such as cooperative, project-based and interdisciplinary learning, all requiring students to move about, work in various sized groups and be active. Furthermore, new models call for all students to learn to higher standards. This in turn has resulted in an increased emphasis on learning styles, multiple intelligences and the special needs of each student.

Smart school planning and investment means replacing the current factory schools with facilities that support these and other examples of current best practices and ongoing research in the learning sciences. This means, among other things, that school populations should be significantly less than previously projected, and that large school populations may in fact be detrimental to the learning process. The development of smaller schools on smaller sites can also save time and money and put schools closer to parents and students.

There are also opportunities to accommodate more efficient and productive uses for educational facilities. For the most part, school facilities in California have been, and continue to be, designed and constructed to serve a specific educational purpose based on a limited educational function. Most educational facilities operate during a 7-8 hour time frame as stand alone institutions, with limited access or joint use by other community organizations. In most cases, the auditoriums, sports facilities, food service, libraries, media center, computer labs and other specialized areas of the school are available for use by the general public only on a very limited basis. Thus, local municipalities must provide duplicate facilities to serve the same functions, with separate budgets for capital improvements, staff and operating expenses.

Smarter designs for new or renovated facilities can accommodate direct community access to spaces like libraries, gymnasiums, auditoriums, performing arts, athletic and recreational spaces that can serve the broader needs of the community. Instead of being designed for a limited time frame of 7 - 8 hours every day, combining community uses can produce facilities that operate 12 - 14 hours, serving a wide range of community needs that can also include things like health clinics, counseling centers and other social services. These designs can be implemented without jeopardizing the health and safety of students, by having certain community activities take place during school hours and others limited to evenings and weekends. The result of these smarter and more efficient joint use design strategies is to reduce duplication of community infrastructure.

Today's educational facilities should also be designed to strengthen the integral relationship that exists between a school and its community in other ways. They should serve a variety of community needs in partnership with a wide spectrum of public, civic and private organizations. They should provide spaces for public meetings and activities. They should provide access to communications technology. They should help meet the leisure, recreational and wellness needs of the community. They should support relationships with businesses that are productive for students and supportive of the local economy. They should provide spaces that facilitate the use of external experts and skilled community volunteers for a variety of functions, including mentorships, apprenticeships and work-based and service learning. When implemented through a community-based planning process, the results can also include increased community engagement and support for a wide range of cultural, social, economic, organizational and educational needs

A national movement integrating schools more closely with the community is growing, with support from the U.S. Department of Education and other organizations. At a recent national conference focused on the design of learning environments, a set of national design principles were identified and adopted. These design principles call for educational facilities and designs that will:

- Enhance teaching and learning and accommodate the needs of all learners;
- Serve as centers of community;
- Result from a planning/design process involving all stakeholders;
- Provide for health, safety and security;
- Make effective use of all available resources;
- Allow for flexibility and adaptability to changing needs.

In addition to the U.S. Department of Education, these design principles have been endorsed by the Council of Educational Facilities Planners International and the American Institute of Architects, which together represent the largest contingent of educational facility planners in the nation.

Smarter schools should be inviting places rather than foreboding institutions. Their locations should encourage community use and their shared public spaces should be accessible - day and night, all year round - to the community. Schools should be places where creative configurations of space expand their use to encompass early learning and adult education; where learning occurs "after hours," at night and on weekends; where school-to-school partnerships, links with businesses and collaboration with higher education are encouraged and supported. They should enable learners of all ages and serve as centers for lifelong learning. Today we know that 12 or 14 years of learning will not be enough to equip people for the rest of their lives. We can't afford to think of graduation as a finish line, and that means that one of the most important end products of schools needs to be citizens who have learned how to continue to learn. Schools should support learning for people of all ages. In short, school facilities should allow access to flexible and comprehensive programs to meet all learning needs. They should provide space and programs for everything from early learning to adult education and training.

Smarter school planning and investment can also extend the learning environment beyond the traditional school site by creating schools in non-traditional settings. When community sites become destinations for educational field trips and extended academic learning centers, the links between school and community are strengthened. But these extensions are not limited to field trips alone. Through partnerships between school boards and other community organizations, a wide variety of community resources like museums, zoos, parks, hospitals and even government buildings can be enlisted to serve as full-time integrated learning centers. In this way, the school is not only the center of the community, but the whole community can also be seen as the center of the school - school as community and community as school - a learning community.

All of these examples point to ways that schools can better serve as the center of their communities, either by playing a more integral role as a community activity center or by extending the learning environment further out into the community to take better advantage of a wider range of community resources. Schools that are more integrated with their communities in these ways can strengthen a community's sense of identity, coherence and consensus. Like a new version of the old town square, they can serve as a community hub, a center for civic infrastructure, a place where students and others can learn to participate and support the common good.

Exemplars of Joint-Use Community-Centered Development

City Heights (San Diego, California)

The City Heights Initiative is an outstanding case study for how leveraging limited public resources and employing a collaborative land-use planning strategy can serve as a catalyst to widespread neighborhood revitalization.

City Heights in San Diego's Mid-City area is a community of 73,000 people on approximately 2,062 acres and was approved as a redevelopment project area in 1992. At the time of plan adoption, City Heights had no center, no focus, and little to no community infrastructure. It was a

victim of physical and economic blight. The area's crime rate was higher than the city as a whole, over one-third of the residents lived below the poverty line, and school performance was far below the city average. Although the area generated very little tax increment, the San Diego Redevelopment Agency did its best to develop and implement comprehensive redevelopment strategies to restore physical and economic health to the neighborhood, unfortunately with no significant success. In 1996, Sol Price, the founder of The Price Club and Price REIT decided to expand his retail development activities into the inner city and tap an underserved market. Price, along with William Jones, a former San Diego City Councilman, formed a company named CityLink Investment Corporation to implement the idea. When Vons, one of only two supermarkets in the neighborhood, closed down, Price and Jones saw an opportunity to build a retail project. However, soon after approaching Vons, they discovered that the City had already bid on the property with the intent of building a police substation. During this same time, the City sponsored an economic development and crime summit to devise new solutions to provide critically needed public assets for the residents of the City Heights neighborhood, including a police substation and public elementary school. It was at this moment that Jones saw an opportunity to develop not just a retail project but to create the necessary components of a healthy, vital community through a collaborative, community-driven revitalization effort.

Recognizing that revitalizing City Heights requires focus on all the factors that contribute to physical and economic blight, Price and Jones committed to employing holistic strategies of redevelopment and making the redevelopment effort community driven. The Urban Village, as the initiative was dubbed, focused on a seven square block area, totaling nearly 38 vacant acres with four city streets. Price and Jones believed that a strong urban core of facilities and services was essential to a healthy community, and, ultimately, the success of their retail project. As an initial step, they provided the funding to initiate a master planning and community outreach strategy for the Urban Village concept. The goal was to develop a master plan that encouraged and facilitated a synergistic around-the-clock relationship between public, community, and educational facilities. The completed project was implemented over a six-year period and developed as a partnering venture between numerous public agencies, private foundations, and CityLink Investment Corporation. The building uses for the Urban Village, in order of implementation include:

- Mid-City police substation and community facility, including a gymnasium
- Rosa Parks Elementary School
- Community park, public library, recreation center, and swim & tennis center with joint-use fields associated with the elementary school
- Multi-purpose theater
- Four-classroom Head Start learning & day care center
- Community College District 32 classroom continuing education facility
- Conversion of Wightman Street to a landscaped parking promenade providing a direct link from the park to the retail center
- Three square blocks of retail, commercial, and residential uses
- 46-units of affordable housing

Through the community-focused master planning process, two critical residential demands were raised. One demand was with regard to public safety. Almost unanimously the residents identified public safety as one of their paramount concerns and many expressed the fact that the area did not have its own police substation. Regrettably, the City could not afford to complete construction of the substation until sometime between 2000 and 2005. In order to expedite construction of the substation, Price Charities, the non-profit entity of the Price REIT, agreed to lend funds to the City for building the substation. In exchange, the City agreed to incorporate the substation in the Urban Village master plan and to relate the building design to the community. The substation was also equipped with public meeting rooms to provide a safe place for community members to meet and foster interaction between the community and the police. Most creatively, the substation was intentionally situated in the same building as the community gymnasium in order to build positive connections between the police and the youth of City Heights. The police substation as the first development project was key to the successful implementation of the Urban Village. It provided the focal point of the Urban Village concept and allowed other investments to go forward. The second key development of the Urban Village concept was the new Rosa Parks Elementary School. During community meetings, many residents expressed the need for a new school. They articulated that their personal investment decisions would be based on whether or not a new school was built.

The overall importance of the new school was not as an attraction for new investors; rather it was intended to provide an economically vibrant community for the benefit of the people who already lived in the neighborhood. The resulting increase in median home values is astounding. In 1996, prior to implementation of the Urban Village initiatives median home values were approximately $80,000. By 2002, the entry price for a single-family home was $160,000. While this is great news for the City Heights community, there is a concentrated effort to ensure that quality affordable housing is built so that residents of City Heights can remain in the community. Other outcomes of the City Heights Urban Village are extraordinary. Tax increment financing for the project area was non-existent prior to the Urban Village project and had more than tripled in by 2002. This provides the Redevelopment Agency with resources with which to enhance and expand redevelopment efforts for the area and beyond. Additionally, and just as important, there is an amazing sense of empowerment to the community and a renewed sense that things can change for the better. People are taking pride in their neighborhood and making efforts to keep it up. The physical space is much more visually appealing, and commercial developers and new businesses are investing in the area. The community now has a center. The City Heights model demonstrates that articulating a clear vision, seizing opportunities to leverage public resources, employing a collaborative land use planning strategy, and securing public sector endorsement, can lead to the restoration of healthy neighborhoods and communities. However, the critical component to the overall success of the Urban Village concept was having an independent, non-profit organization serve as a predevelopment partner to the City and CRA, with the flexibility to react appropriately to any new challenge, access to predevelopment funding and the willingness to take on risk inherent in predevelopment activities.

Elizabeth Street Learning Center (Los Angeles, California)

In 1991, in response to President Bush's "Goals 2000", the New American School's Development Corporation (NASDC) launched a nationwide proposal. The Los Angeles Educational Partnership, United Teachers Los Angeles (UTLA) and LAUSD formed a partnership to write a design for a twenty-first century school. The resulting design was one of only 11 proposals selected by NASDC and in 1992 Elizabeth Street School became the first "Urban Learning Center" site. ELC is a model site for the Urban Learning Centers (ULC), one of the eight designs of the New American Schools of the 21st Century. The center is located in the City of Cudahy and is a Los Angeles Unified School District (LAUSD) school. ELC serves over 3,000 Pre-K through 12th grade students.

The Urban Learning Center design restructures the school around 3 key components: shared governance, innovative curriculum and instruction, and comprehensive student and family support. This third component has become known as "Learning Support." ELC is a recognized model for the implementation and refinement of the Learning Support component. The Urban Learning Center design is supported at ELC by advanced technology and training for curriculum and instruction.

The vision at ELC is to enable all children to learn by addressing their educational, social, mental health and health needs in a comprehensive and integrated manner in collaboration with public, private and civic partners. Key components of the Learning Support model at ELC include:

- Recognition of Learning Support as an integral part of the school infrastructure, including space, staffing and budget allocations for its maintenance and growth
- Partnership with local medical center to provide an on-site health clinic
- Mental health services provided by university partners
- An integrated and shared case management system including a collaborative referral review process
- Strong community outreach including over 1,000 hours per month in parent/community volunteers
- Adult education that serves over 600 adults daily on campus and additional adults at community sites and through distance learning
- High school academies to provide career and college guidance for students including mentor and internship programs
- Development of Early Literacy and additional Early Childhood programs located on site in partnership with LAUSD Adult School Division and Head Start
- After-school tutoring programs
- School campus has extended hours 7-9 four days a week and is open Saturdays.

ELC is also known for its comprehensive early childhood programs, and is seen as a model School Readiness site by the California Children and Families Commission. The early childhood programs at ELC are funded by State Preschool funds, LAUSD integration funds, and grants and partnerships with Saint Francis Medical Center in Lynwood, the Los Angeles County Office of Education – Head Start Division, the UCLA Center for Mental Health in Schools, CHCFC, and the College and Education Resource Centers Initiative at California State University Dominguez Hills. California State University at Los Angeles, UCLA and the University of Southern California provide interns in social

work and marriage, family and child counseling. Sustainable funding sources include Title 1 dollars. Support from city government and state representatives is also critical.

Boyle Heights

In 1996 the Pico-Aliso neighborhood of Boyle Heights was in a state of neglect and disrepair. For the last 50 years its primary housing, the Pico-Aliso housing project, had served as the home for the working poor. By the year 2000, a majority of the population in addition to living in poverty, also spoke a language other than English at home. In fact, over 35% of residents make less than $25,000 per year and nearly 2/3 of adults have less than a 12th grade education. The children in this neighborhood are also struggling, with 74% of third graders in the area testing at or below basic or far below basic levels in English and Language Arts. In perspective, the County as a whole has only 41% of its 3rd graders at or below basic English. These social woes are exacerbated each year because the Pico-Aliso neighborhood has a higher percentage of children age 0-6, 32%, than either the City or County.

The area received an infusion of federal funds in 1996 for the redevelopment of the Aliso Pico public housing development. The Vista del Sol community was built offering affordable 3 and 4 bedroom homes for rent and for ownership in 2004. The only downside to this development was the loss of 75 childcare spaces on adjacent land. Also, in 2004, the LACMTA began planning for an extension of the Gold Line to East Los Angeles via Pico-Aliso, including a stop down the block from the new Vista del Sol development. To complement this new development, in 2005, LAUSD determined that it was also prepared to build a new 1,000-student high school in the area. Unfortunately, the only suitable location was at the site of another childcare facility, which had over 50 children attending.

New Schools Better Neighborhoods (NSB), with its collaborative planning process engaged local residents with government officials from LAUSD, the Housing Authority of Los Angeles, LA County Metropolitan Transit Authority, the Community Redevelopment Agency and a host of local non profits including Plaza Community Center and its nonprofit sponsor the United Methodist Ministries (UMM) to preserve and replace the child care lost with the creation of Vista del Sol and the upcoming high school.

The concept agreed to is the proposed Boyle Heights development on East 1st Street adjacent to the MTA Gold Line, one block from the new Vista del Sol residential community and the new East LA High School #1. The proposed development is a block-long joint-use (child care & community nonprofit space) that can bring together under one roof the vital community services that are needed in the immediate Pico-Aliso neighborhood.

The specific development objectives are to create a new two-story community center that will include:

- 13,500 square feet for a childcare center that serves at least 100 children ages 0-5;
- 3,250 square feet of new space for the CDD Youth Opportunity Program;
- 8,182 square feet for additional community nonprofits;
- 1,200 square feet for a shared community education room;
- 7,000 square feet for an exterior play area; and
- 53-space environmentally sensible parking lot with a

250,000 gallon underground cistern that traps and cleans storm water runoff from the site and adjacent East 1st Street (including significant amounts from the on- and off-ramps of the adjacent 101 freeway) and makes the water available for beneficial use. The aforementioned will be funded by the City, County, Caltrans, and other expected contributors.

After working with the community, governmental agencies and by adding the Boyle Heights Learning Collaborative to its team, NSBN was able to secure temporary space for the 50 capacity child care displaced by the high school, a commitment from UMM for $1 million to the development of a new child care center and $750,000 grant from the City to construct an environmentally sensible parking lot that will reduce storm water pollution in the neighborhood, and a commitment from LACMTA to contribute their property on East 1st Street for this effort. Plaza Community Center has agreed to serve as the primary developer for the project with financial support from HACLA, the LA County MTA, and several foundations. The new facility will serve as Plaza's headquarters with other proposed tenants including the International Institute of Los Angeles (child and adult daycare in the ONEgeneration model of combined programs); the BHLC, the Mayor's Partnership for Educational Excellence; a regional after-school/break utility trades training program serving Roosevelt and new East LA HS #1 students with funding from the local utilities; HomeGirl café job training project in partnership with HomeBoy Industries; offices for the United Methodist Ministries – LA District; a small branch of the LA City Library; a certified farmers market in the parking lot with co-scheduled healthy cooking/nutrition classes; and other community-focused programs including a referral health clinic affiliated with White Memorial Medical Center or some other regional healthcare providers that involves healthcare screenings, insurance enrollment, and appointment referrals.

SUMMARY

The projects undertaken by third party intermediaries invariably represent a variety of community-specific situations that reflect the input of the local community in the planning and design process. The opportunity for the community to become engaged in this process provides a strong sense of ownership for the project that becomes evident in their involvement in the funding and construction phases as well as during operations where the neighborhood's sense of ownership prevents vandalism or abuse. Similarly, these exercises provide residents with the opportunities for involvement and the development of skills that are often manifested in other civic engagement processes that the residents become involved with including neighborhood councils, school PTAs and local community-based programs.

Now that this portfolio of models exists, we must take the joint-use concept to scale which requires legislation at the state levels to develop new rules, regulations, and funding vehicles to facilitate the easy access to existing and future joint-use funds since even when those limited funds exist the methods for accessing them are cumbersome and prevent sufficient access to them which often leads to the concerns about underutilization of existing funds in the pursuit of additional resources. The short-term availability of local, regional, and state bonds for education, libraries, healthcare, criminal justice, and other program facilities makes the immediacy of these projects that must be planned, designed, and implemented as quickly as possible or face loss of potential funding very important. As Robert Hertzberg, former speaker of the California State Assembly

has frequently said "This is a once in a decade, once in a lifetime opportunity …" to access these limited funds.

CASE STUDY

The Role of Third Party Intermediaries: New Schools Better Neighborhoods

New Schools Better Neighborhoods (NSBN) was formed to advocate for a vision of public facilities, most especially schools, as vital community centers, and to assist families and neighborhoods in creating built models of community centered learning centers. NSBN is an independent, professionally managed, community-led master planner, focused on leveraging billions of dollars in state and local public facility bonds for the benefit of families and children. They collaborate with community-based partners to facilitate the planning and construction of joint-use urban learning centers that are intended to become the vital center of the neighborhood. These facilities are designed to offer an array of social services accessible to all community residents and local stakeholders from dawn to dusk.

NSBN's joint-use philosophy reflects the focus on ameliorating the long-term academic and facility deficits that plague low-income communities. These deficits, along with the lack of early education, recreation, and access to healthcare, contribute not just to reduced school attendance, poor academic achievement, and high dropout rates, but also to the involvement of students in gang activities that threaten safe passage to, from, and within, their schools. Through proper planning, schools have the opportunity to serve as the "heart" of their communities and to promote the educational, physical, mental, and social wellbeing of these host communities.

An organization like NSBN makes available to project partners specific skill sets they neither currently possess nor can afford. Foremost among these are professional expertise, planning process facilitation, access to business and political leadership to form relationships in support of projects, and a formalized independent analysis of facilities that extend beyond the bounds of the specific project into the community. As an independent mediator, NSBN fully engages stakeholders in the creation of local community learning centers. They conduct charettes and meetings to ensure that facilities are programmed and planned as shared, joint use, and environmentally smart school complexes that respond to and contribute to the revitalization of stressed urban neighborhoods. A few examples of both past and current project partners include the Los Angeles Unified School District (LAUSD), UCLA Center for Healthier Children, Families and Communities, Trust for Public Land (TPL), Boys and Girls Club, YMCA, Los Angeles Public Library (LAPL), Los Angeles County Department of Parks and Recreation, United Methodist Ministries, TreePeople, and Assistance League of Southern California.

The NSBN portfolio of projects in Southern California includes:

- Whelan Elementary Project (Lennox): The elementary school is being expanded to include space for joint use facilities that will include a preschool, Healthy Start, School Readiness, and adult education programs
- Bodger Park Project (Lawndale): An underutilized two acre area of the park, owned by Lawndale Elementary School District, was originally intended to house only a new preschool. With NSBN's help, it has been redesigned to include a preschool, early education, adult education, family counseling and health care services, a public garden, a walking trail, and a possible gymnasium. The park is located in a densely

populated neighborhood, making it a commodity in an area where green space is not readily accessible.

- Westlake-Gratts Project (Pico Union): At the request of the Mayor of the City of Los Angeles and a local City Councilmember, NSBN worked in partnership with the City of LA and LAUSD to intelligently plan for and locate public investments in childcare, housing, schools and other community essentials in this critically impacted neighborhood.
- Los Cerritos Elementary Project (Paramount): In collaboration with Paramount Unified School District, City of Paramount, Southern California Edison, Gateway Cities Partnership, and Quatro Design Group, a plan was created to modernize Los Cerritos Elementary and incorporate joint-use development The group created a plan that includes: (1) a park strategically placed in close proximity to Los Cerritos Elementary to provide students with increased access to open space and exercise activities; and (2) the development of a multi-purpose building on the school campus that will house a multipurpose room, adult education, childcare and preschool facilities. This particular neighborhood is the poorest, densest, and least educated in the city of Paramount.

Since its inception, NSBN has become one of California's most respected neighborhood-led master planners with endorsements from a host of civic leaders including Mayor Villaraigosa (Los Angeles), Mayor Bill Bogaard (Pasadena), and Superintendent Ken Knott (Lennox School District). The organization has been and continues to be committed to reforming existing approaches to siting and designing neighborhood resources such as public schools, parks, libraries and housing. They have two fervent aims:

- To see more grandmothers strolling rather than police officers patrolling school campuses; and
- To see more accessible preschool, recreational, adult education, and health-related services on or adjacent to school campuses as opposed to more single-use fenced-in mega-schools open weekdays only from 8 o'clock in the morning to 3 o'clock in the afternoon.

Energy

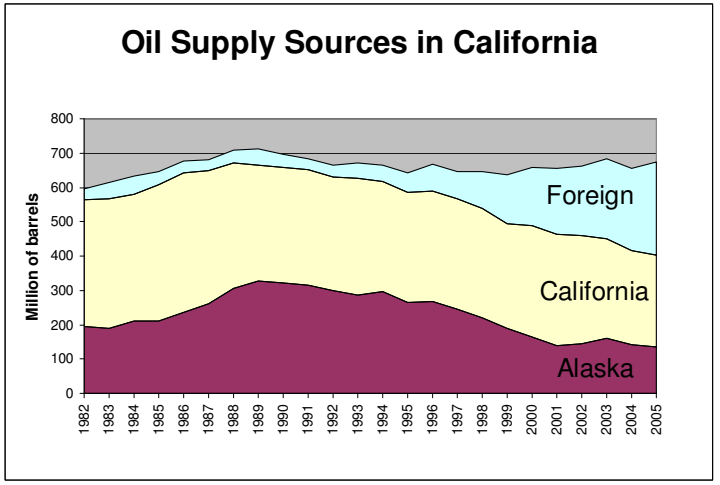
THE CHALLENGE

Clean, stable and sustainable sources of energy for Southern California are critical to supporting a healthy and resilient region. In developing future plans, SCAG must fully weigh and consider energy supply, efficiency, consumption, and environmental impacts such as greenhouse gas emissions. California relies on petroleum-based fuels for 96 percent of its transportation needs.[1] The SCAG region consumes over 23 million gallons of petroleum per day, roughly half of California's oil consumption[2] and vehicle fuel consumption in the region has increased 20 percent over the last ten years.[3] Furthermore, only 15 percent of the electricity consumed in the region is generated from renewable sources.[4] At the same time, SCAG forecasts the region will add over 6 million people, 2 million households, and 3 million jobs between 2000 and 2030. These additional people, households, and jobs will place new demands on energy production and increase the amount of air pollution, including greenhouse gases, generated in the region.

In the face of this growth, there is the mounting realization that we are living in an energy constrained world. Both environmental and geopolitical factors are causing energy experts to question the long term viability of a fossil fuel-based energy future. Concerns about global climate change have motivated action at the federal, state and local levels to move away from fossil fuels, while continued oil price fluctuations and supply constraints have helped raise awareness about the unsustainability of our dependence on imported petroleum.

The U.S. represents 5 percent of the world's population, but consumes 25 percent of the world's oil.[5] In addition, the U.S. Department of Energy forecasts that world energy consumption is projected to increase by 57 percent from 2004 to 2035 and that U.S. consumption of liquid fuels is projected to increase by 30 percent between 2005 and 2030, from 21 million barrels per day to 27 million barrels per day.[6] Most of the U.S. increase is anticipated in the transportation sector, which is projected to account for 73 percent of total liquid fuels consumption in 2030, up from 67 percent in 2005.[7]

At the same time, U.S. currently imports 58 percent of its petroleum and California imports approximately 40 percent of its petroleum. In California, oil production peaked in 1985. Since then, the share of oil from foreign imports has increased rapidly, from below 10 percent in 1995 to over 40 percent in 2006, as shown in the chart below.[8] In 2005, California received 35 percent of its foreign imports from Saudi Arabia, 24 percent from Ecuador, and 12 percent from Iraq.[9] Globally, increasing demand from the growing



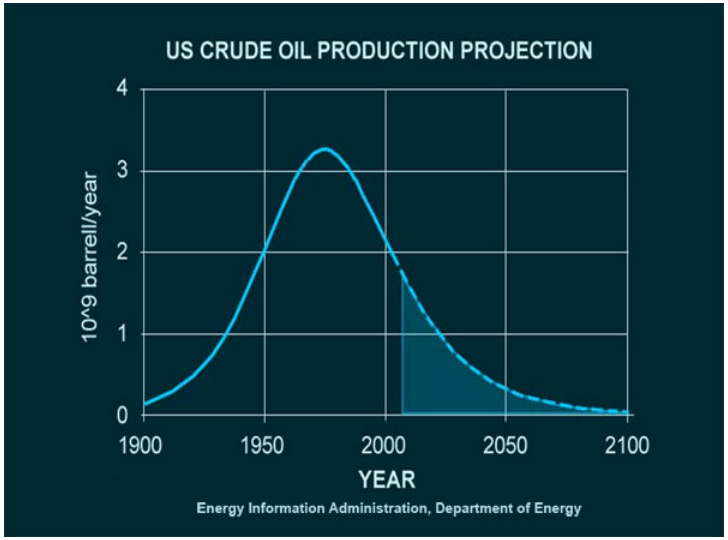
Source: California Energy Commission, Oil Supply Sources to California Refineries. Retrieved December 20, 2006 from http://www.energy.ca.gov/oil/statistics/crude_oil_receipts.html

economies of India and China will further tighten world oil supplies. According the U.S. Energy Information Agency (EIA), India has become the fifth largest consumer of oil in the world during 2006.[10] China is the world's most populous country and the second largest energy consumer behind the United States.[11]

There are additional concerns that the nation's dependence on oil, especially from the Persian Gulf, requires a U.S. military presence, with all of its associated economic and social costs.[12] As identified by the United States Government Accountability Office, oil production could be shut down by wars, strikes, and other political events in many countries with proven oil reserves. For example, the countries of Iran, Iraq, Nigeria and Venezuela contain one-third of worldwide reserves but face high levels of political risk. Furthermore, countries defined as having medium to high levels of political risk held 63 percent of proven worldwide oil reserves.[13]

Furthermore, much of the oil remaining in the ground can only be accessed by using complex and costly technologies that present greater environmental challenges than previous technologies used for most of the oil produced to date. Enhanced oil recovery (EOR) technologies are much costlier than conventional production methods and increase greenhouse gas emissions due to the additional energy required to perform the tasks.

Oil is a finite and non-renewable resource and it is uncertain how future energy consumption trends will be sustained with the current political, environmental and technological constraints. Our nation's reliance on petroleum for our energy needs is even more problematic because of the global trend toward an inevitable turning point: - "peak oil"- the peak and then decline of global oil production. Peak oil is the point of maximum oil production whether from a single well, a country, or the planet as a whole. The maximum point of production is expected to happen when about half or slightly more of the ultimately recoverable oil has been produced. To be clear, peaking does not mean "running out." Rather, it indicates the point where global production can no longer be maintained or increased. Production will begin to decline, year after year. Geophysicist M. King Hubbert correctly predicted the 1971 peak in U.S. oil production as shown in the graphic from the U.S. Energy Information Administration and further predicted that sometime between 2005 and 2025, world oil production would reach a peak and begin a sharp decline.[14]



A fundamental problem in predicting oil peaking is the poor quality of and possible political biases in world oil reserves data. The recent range of estimates varies from late 2005 to a belief that it will never happen. Most estimates are based on different geological assumptions and investments

in expanded oil production. In addition, the reserves reported by the Organization of the Petroleum Exporting Countries (OPEC) lack transparency and independent verification.[15,16] This wide range of peak oil forecasts presents a very difficult dilemma for policy makers. On one hand, action could be delayed until there is a consensus from scientists; however that is unlikely given the strongly held divergent views. On the other hand, waiting to take action could prove costly and result in severe consequences. Initiating a move toward conservation, efficiency, demand reduction and renewables 20 years before peaking would offer the possibility of avoiding a world liquid fuels shortfall and significant economic hardship.[17]

The International Energy Agency reported in July 2007 that the world will face an oil supply "crunch" in the next five years. This is due to faster than expected falls in supply in mature areas such as the North Sea and Mexico and new prospects in Russia are experiencing long delays. As a result, oil supply will increase approximately 1 percent annually while demand will grow at an annual rate of 2.2 percent.[18] The world supply crunch will impact California and the SCAG region. A fuel shortage will take a toll on California's economy as consumers are spending more of their household income on gasoline than ever before, particularly with development patterns that create long commutes without access to public transportation. High fuel prices also reduce profit margins for the manufacturing and industrial sectors, which pass the higher cost of their goods and services to consumers. Since September of 2004, the monthly average price of gasoline has increased by more than 35 cents per gallon, costing consumers an additional $6.1 billion for gasoline.[19]

There is also a tightening of natural gas markets due to decreasing supplies and growing demand for natural gas, which makes up 25 percent of the nation's energy use and is by comparison, a relatively clean source of electricity compared to sources such as coal. The U.S. and California will lose a major source of natural gas imports by 2010 due to the decline of Canada's largest producing basin, the Western Sedimentary Basin, coupled with an approximately 2 percent projected average annual growth in Canada's domestic consumption.[20] Although some research has shown a world peak in natural gas occurring a decade after oil, the U.S. and California could experience the effects sooner. For example, natural gas has become the preferred source of electricity generation, supplying over 40 percent of California's power.[21] Also, unlike oil, it is more difficult and expensive to import replacement natural gas from overseas – as it has to be liquefied for transport and then re-gasified for distribution.[22] An increase in natural gas prices would negatively affect the economy, potentially leading to reduced sales and employment.[23]

In addition to the uncertainty regarding fossil fuels supplies, there is also uncertainty about how climate change will alter economies and ecosystems at the global, regional and local levels. Transportation is the largest source of greenhouse gas emissions in California, representing 41 percent of emissions. California is the second largest emitter of GHG emissions in the United States, next to Texas. Only nine nations have greater total emissions than the state of California. In 2004, California produced 492 million gross metric tons of carbon dioxide – equivalent GHG emissions, including imported electricity and excluding combustion of international fuels and carbon sinks or storage.[24] Climate change poses serious risks to our economy, water supply, biodiversity, and public health. These potentially catastrophic impacts have led to new local and state efforts to reduce the amount of greenhouse

gas emissions released into the atmosphere. The landmark legislation, AB 32 or the Global Warming Solutions Act, requires reduction of the state's greenhouse gas (GHG) emissions to 1990 levels by 2020. This emissions target is equal to a 25% reduction from current levels. Longer term targets have also been set through Executive Order S-3-05, which calls for a reduction of GHG emissions to 80% below 1990 levels by 2050.

THE PLAN

The demand for oil must decline at a similar rate of production in order to avert economic and social consequences of increased prices. If oil and gas become scarce and expensive, it will have profound implications for our economy and way of life.[25] A recent study funded by the U.S. Department of Energy determined that viable mitigation options exist but must be initiated more than a decade in advance to avoid severe economic disruptions.[26]

This section lays out a strategy to reverse the current trends and diversify our energy supplies to create clean, stable, and sustainable sources of energy that address energy uncertainty and environmental health. This plan includes strategies that the region can take to reduce fossil fuel consumption and increase the use of clean, renewable technologies. SCAG will continue to work with stakeholders at the federal, state, regional and local levels to promote these policies and encourage their implementation. However, leadership is needed to coordinate and provide an ongoing forum for local and regional programs to implement an energy savings program.

As stated in the 2006 State of the Region, we can prepare for these inevitable energy challenges by encouraging community participation, reinvesting in public transportation, and revising land use, zoning and building codes to optimize the consumption of our energy resources. There are numerous strategies that the public sector can undertake to address our energy challenges. These make up the bulk of the proposed Action Plan to promote a more sustainable energy supply.

Land Use and Building Design

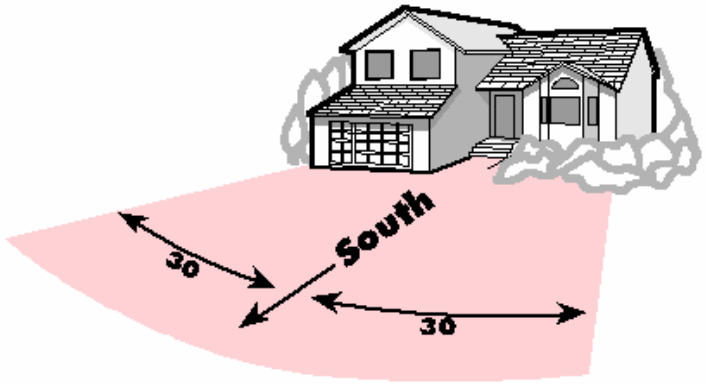
Strategies to reduce energy consumption include both where development occurs and how it is designed. Land use patterns have shaped energy use by increasing the amount of travel necessary to reach jobs and services. This growth pattern has resulted in an increase in vehicle miles traveled (VMT) at a rate of more than 3 percent a year between 1975 and 2004.[27] Increased VMT results in additional demand for petroleum and greenhouse gas emissions. As such, transportation accounts for 41 percent of the state's greenhouse gas emissions. Building design and housing types also have a strong relationship to energy use and are thus, a strong focus of this chapter. For example, residents of single family detached housing have been found to consume 22 percent more energy than those of multifamily housing and 9 percent more than those of single-family attached housing.[28] SCAG has commissioned research to identify effective strategies to reduce energy use, with an emphasis on land use. The discussion that follows is a summary of the findings.

Mixed land use (i.e., residential developments near work places, restaurants, and shopping centers) with access to public transportation has been shown to save consumers up to 512 gallons of gasoline per year. It is estimated that households in transit-oriented developments drive 45 percent less than residents in auto-dependent neighborhoods.[29] With this reduction, there is less overall energy consumption and less greenhouse gas emissions from personal vehicles. Going hand-in-hand with mixed-

use development, is the development of pedestrian corridors and bike trails that connect residents to work sites, shops, and recreational opportunities, which can also realize a reduction of personal vehicle use and fuel consumption.

Neighborhood energy systems allow communities to generate their own electricity and offer potential advantages such as cost reductions and energy savings up to 40 percent. Micro-grids are a subset of community-based distributed generation (DG) or combined heating and power (CHP) systems that focus on power quality and reliability. Micro-grids are used in communities (often industrial parks) that require higher electric reliability and higher power quality than can be provided by the electric utility. Rather than invest in systems for individual buildings or businesses, the community pools resources and shares the benefits of the community-based system. Generally, micro-grids include DG and power conditioning, but may also include energy storage, CHP, and/or renewables.

Orienting streets and buildings for best solar access could significantly reduce energy requirements throughout the life of a building. Streets should be designed to take advantage of passive solar heating and most buildings should be oriented such that the long axis runs east/west. The southern most face of the building should face within 30 degrees of south. Also, strategically planting trees on a residential property can reduce attic temperatures up to 20 degrees Fahrenheit and wall temperatures up to 15 degrees Fahrenheit on a summer sunny summer day as well as reduce air conditioning costs up to 20 percent. The trees absorb numerous pollutants (dust, ash, pollen, smoke), remove carbon from carbon dioxide (CO_2) and release oxygen. They also trap and hold up to 50 gallons of water (each) reducing storm water runoff, increase water filtered in the ground, reduce soil erosion, and require minimal watering when mature. Total present value benefits, including energy, environmental and aesthetics are estimated at $1,399,776,270 or roughly $699.89 per tree.[30]



The southern most face of the building should face within 30 degrees of south.
Source: Oikos: Green Building Source
http://oikos.com/esd/42/solar.html

Green buildings can significantly reduce local environmental impacts, regional air pollutant emissions and global greenhouse gas emissions. Green building standards involve everything from energy efficiency, usage of renewable resources and reduced waste generation and water usage. For example, water-related energy use consumes 19 percent of the state's electricity. Furthermore, the residential sector accounts for 48 percent of both the electricity and natural gas consumption associated with urban water use.[31] While interest in green buildings has been growing for some time, cost has been a

main consideration as it may cost more up front to provide energy-efficient building components and systems. Initial costs can be a hurdle even when the installed systems will save money over the life of the building. Energy efficiency measures can reduce initial costs, for example, by reducing the need for over-sized air conditioners to keep buildings comfortable. Undertaking a more comprehensive design approach to building sustainability can also save initial costs through reuse of building materials and other means.

A comprehensive and persuasive study of the value of green building savings is the 2003 report to California's Sustainable Building Task Force. In the words of the report:

> "While the environmental and human health benefits of green building have been widely recognized, this comprehensive report confirms that minimal increases in upfront costs of about 2% to support green design would, on average, result in life cycle savings of 20% of total construction costs – more than ten times the initial investment. For example, an initial upfront investment of up to $100,000 to incorporate green building features into a $5 million project would result in a savings of $1 million in today's dollars over the life of the building."[32]

Alternative Fuels

Alternatives to petroleum and infrastructure will be needed for the SCAG region to achieve the ambitious performance outcome of reducing fossil fuel use 25% below 1990 levels by 2020. California's leadership on research and development of alternative transportation fuels will help the SCAG region meet these goals. For example, Assembly Bill 1007 provides a comprehensive framework to examine broad transportation fuel issues and effectively integrate transportation energy and air quality policies. The California Energy Commission (CEC) and California Air Resources Board (ARB) also are analyzing numerous options to reduce the use of conventional transportation, which will assist the SCAG region as it grapples with our transportation energy future.

[potential side bar: The use of electricity as a transportation fuel for transit, automobiles and goods movement reduces air emissions ARB has estimated that electric vehicles produce only about 6 percent of the air pollution of the cleanest new internal combustion cars available today. The number of electric transportation and goods movement technologies is expected to triple by 2020 to between 900,000 and 1 million units due to known regulatory requirements and financial incentive programs that encourage the use of electric technologies because of their inherent emissions benefits.[33]]

Each alternative fuel has costs, benefits and performance characteristics that will define its effectiveness as a replacement to petroleum. For example, the CEC's 2005 Integrated Energy Policy Report offers a glimpse into the challenges ahead for replacing fossil fuels with alternatives. For example, an increase in the amount of ethanol in gasoline would result in a loss of fuel economy and require motorists to purchase more gasoline since E-85 contains almost 30 percent less energy than gasoline.[34] These energy challenges will force the region to become more energy efficient and through technology enhancements, pricing mechanisms, and integrating land use and transportation decisions.

Renewable Energy

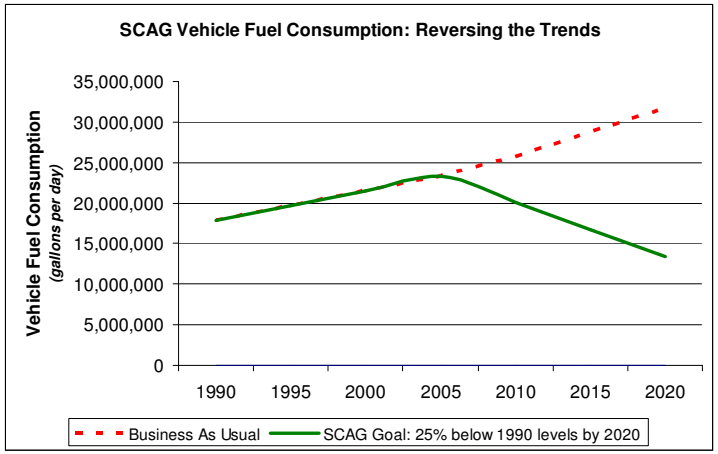
Additional efforts will be needed to reach SCAG's performance outcome of 20% renewable energy supply by 2010 and its longer term goal of 30% by 2020.[35] Of the electricity consumed in the SCAG region in 2006, an average of 7 percent was generated from eligible renewables. By comparison, 10 percent of the electricity produced in California was renewable.[36] The CEC recommends various opportunities to expand the renewable energy mix such as adopting clear and consistent policies for sustainable biomass development, taking advantage of California's abundant solar energy resources, and tapping into distributed generation and combined heat and power facilities. California has the potential to produce ethanol from cellulosic biomass material such as municipal, agricultural, and forestry wastes. Solar offers a clean, renewable and reliable energy sources. The California Solar Initiative offers incentives and funding for solar installations in an effort to create 3,000 megawatts of new solar-produced electricity by 2017. Distributed generation also offers an option to central station fossil-fueled generation since it is produced on site and connected to a utility's distribution system. The most efficient and cost-effective form of distributed generation is cogeneration or combined heat and power, which recycles waste heat. These technologies help customers become energy independent and protect them from supply outages and brownouts. SCAG will continue to monitor the development of these renewable resource opportunities as well as track their costs and benefits.

Public Transportation

As identified in the 2006 State of the Region, total transit boardings in the region in fiscal year 2005 increased by 16 percent from 617 million to a record high of 672 million. Nationally, transit boardings also increased at a faster rate than the population. This shift is good news since increases in public transit ridership can proportionately reduce VMT, congestion, fuel consumption and improve air quality. A recent study on public transportation found that current public transit use reduces U.S. gasoline consumption by 1.4 billion gallons each year. In a "growth scenario," the study assumed that ridership would double over current levels due to expanded transit systems, new routes, and improved land use patterns. It concluded that the total national fuel savings from public transportation would double from current savings and would equal 2.8 billion gallons per year.[37] SCAG has the opportunity to influence future fuel demand by increasing funding public transportation in the Regional Transportation Plan (RTP), which integrates the transportation plans of all of the cities and counties within the region. By prioritizing funding priorities for energy efficient transportation projects, the region can begin to reduce petroleum demand and increase air quality.

Reversing the Trend

Leadership is needed to coordinate and provide an ongoing forum for local and regional programs to address our energy challenges and reverse our unsustainable dependence on fossil fuels. As shown in the graphic below, SCAG can lead the way by establishing actions that the region can take to reduce fossil fuel consumption and increase the use of clean, renewable technologies. SCAG will continue to work with stakeholders at the federal, state, regional and local levels to promote these policies and encourage their implementation. The remainder of this chapter will identify how to reverse the current trends and become less dependent on fossil fuels.



Source: California Department of Transportation, Division of Transportation System Information. (December 2006, November 2003). California Motor Vehicle Stock, Travel and Fuel Forecast. 1990 consumption levels are estimated based on trends.

ENERGY GOALS

- Reduce our region's consumption of non-renewable energy by:
    - Supplying the energy needs of the region today in a way that reduces the negative environmental impacts, social inequities, and economic hardship on future generations;
    - Developing the infrastructure and social capital to adapt to a future energy economy with a constrained supply.
- Increase the share of renewable energy in the region by:
    - Ensuring the resiliency of the region's economy by encouraging and supporting renewable energy infrastructure; and
    - Developing renewable energy sources that reduce the amount of air emissions emitted through the combustion of fossil fuels.

ENERGY OUTCOMES

- Decrease the region's consumption of fossil fuels 25% from 1990 levels by 2020.
- Increase the share of renewable energy generation in the region to 20% by 2010, with additional increases to reach 30% by 2020.

ENERGY ACTION PLAN

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Policies															
		x	EN-1. SCAG shall continue to work with the state to develop approaches for evaluating environmental impacts within the Compass Blueprint program, particularly energy, air quality, water, and open space and habitat.[i]	x	x	x	x	x	x				x	x	x
x			EN-2. SCAG shall continue to develop energy efficiency and green building guidance after the RCP is adopted to provide direction on specific approaches and models and to specify levels of performance for regionally significant projects to be consistent with regional plans.	x	x	x	x	x	x	x		x	x		x
		x	EN-3. SCAG shall continue to pursue partnerships with Southern California Edison and the California Public Utilities Commission to promote energy efficiency and reduce greenhouse gas emissions in the region.			x		x		x					x
		x	EN-4. SCAG shall continue to convene key decision makers to discuss energy issues and make recommendations to SCAG's Energy and Environment Committee, where appropriate.	x	x	x		x					x	x	x
		x	EN-5. SCAG shall convene key stakeholders to evaluate and where feasible, recommend transportation measures such as congestion	x	x	x		x		x					x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			pricing, a refined regional goods movement system and an environmental mitigation strategy that reduces fossil fuel consumption.												
	x		EN-6. SCAG shall monitor and provide input towards development of state energy projections and tools, including the Integrated Energy Policy Report and similar policy documents as well as future efforts to determine the implications of energy generation and consumption for the built environment.	x	x	x		x							x
	x		EN-7. SCAG shall encourage credits for clean post recycle conversion technologies to produce energy or for technologies that offset energy use or emissions.			x		x		x		x	x		x
Local Government Policies															
x			EN-8. Developers should incorporate and local governments should include the following land use principles that use resources efficiently, eliminate pollution and significantly reduce waste into their projects, zoning codes and other implementation mechanisms: • Mixed-use residential and commercial development that is connected with public transportation and utilizes existing infrastructure.	x	x	x	x	x	x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			• Land use and planning strategies to increase biking and walking trips.[ii]												
x			EN9. Developers and local governments should integrate green building measures into project design and zoning such as those identified in the U.S. Green Building Council's Leadership in Energy and Environmental Design, Energy Star Homes, Green Point Rated Homes, and the California Green Builder Program. Energy saving measures that should be explored for new and remodeled buildings include: • Using energy efficient materials in building design, construction, rehabilitation, and retrofit • Encouraging new development to exceed Title 24 energy efficiency requirements. • Developing Cool Communities measures including tree planting and light-colored roofs. These measures focus on reducing ambient heat, which reduces energy consumption related to air conditioning and other cooling equipment. • Utilizing efficient commercial/residential space and water heaters: This could include the advertisement of existing and/or development of additional	x	x	x	x	x	x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			incentives for energy efficient appliance purchases to reduce excess energy use and save money. Federal tax incentives are provided online at http://www.energystar.gov/index.cfm?c=Products.pr_tax_credits. • Encouraging landscaping that requires no additional irrigation: utilizing native, drought tolerant plants can reduce water usage up to 60 percent compared to traditional lawns. • Encouraging combined heating and cooling (CHP), also known as cogeneration, in all buildings. • Encouraging neighborhood energy systems, which allow communities to generate their own electricity • Orienting streets and buildings for best solar access. • Encouraging buildings to obtain at least 20% of their electric load from renewable energy.[iii]												
x			EN-10. Local governments should include energy analyses in environmental documentation and general plans with the goal of conserving energy through the wise and	x	x	x		x					x		x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			efficient use of energy. For any identified energy impacts, appropriate mitigation measures should be developed and monitored. SCAG recommends the use of Appendix F, Energy Conservation, of the California Environmental Quality Act.												
x			EN-11. Local governments should consider various best practices and technological improvements that can reduce the consumption of fossil fuels such as: • SCAG shall encourage investment in transit, including electrified light rail • Expanding light-duty vehicle retirement programs • Increasing commercial vehicle fleet modernization • Implementing driver training module on fuel consumption • Replacing gasoline powered mowers with electric mowers • Reducing idling from construction equipment • Incentivizing alternative fuel vehicles and equipment • Developing infrastructure for alternative fueled vehicles	x	x	x		x		x					x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			• Increasing use and mileage of High Occupancy Vehicle (HOV), High Occupancy Toll (HOT) and dedicated Bus Rapid Transit (BRT) lanes • Implementing truck idling rule, devices, and truck-stop electrification • Requiring electric truck refrigerator units • Reducing locomotives fuel use • Modernizing older off-road engines and equipment • Implementing cold ironing at ports • Encouraging freight mode shift • Limit use and develop fleet rules for construction equipment • Requiring zero-emission forklifts • Developing landside port strategy: alternative fuels, clean engines, electrification												
x			EN-12. Developers and local governments should submit projected electricity and natural gas demand calculations to the local electricity or natural gas provider, for any project anticipated to require substantial utility consumption. Any infrastructure improvements necessary for project construction shall be completed according to the specifications of	x		x		x							x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			the energy provider.												
x			EN-13. Developers and local governments should encourage that new buildings are able to incorporate solar panels in roofing and tap other renewable energy sources to offset new demand on conventional power sources.	x		x		x		x					x
x			EN-14. Local governments should support only the use of the best available technology including monitoring, air, and water impacts for locating any nuclear waste facility.			x	x	x					x		
x			EN-15. Developers and local governments should explore programs to reduce single occupancy vehicle trips such as telecommuting, ridesharing, alternative work schedules, and parking cash-outs.		x	x		x		x					x
x			EN-16. Utilities and local governments should consider the most cost-effective alternative and renewable energy generation facilities. [Potential call out box – refer to the Solid Waste Chapter and description of conversion technologies.]	x		x		x		x		x			x
x			EN-17. The project implementation agency should consider increasing capacity of existing transmission lines, where feasible.	x		x		x	x			x			
x			EN-18. The project implementation agency should install and maintain California Best			x	x	x						x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			Available Control Technologies on all power plants at the US-Mexico border.												
		x	EN-19. Subregional and local governments should explore participation in energy efficiency programs provided by their local utility such as the Ventura Regional Energy Office, South Bay Energy Savings Center, and the San Gabriel Valley Energy Wise program. These programs can offer customized incentives and public awareness campaigns to reduce energy consumption.			x		x		x					x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Initiatives															
		x	ENSI-1: SCAG shall consider energy uncertainty into its future planning and programming, including the Regional Transportation Plan and the Regional Transportation Improvement Program.	x	x	x		x		x	x				x
		x	ENSI-2: SCAG shall continue to develop, in coordination with the California Air Resources Board, a data and information collection and analysis system that provides an understanding of the energy demand and greenhouse gas emissions in the SCAG Region.	x	x	x	x	x							x
Federal and State Government Strategies															
	x		ENSI-3: The Secretary of Energy, in coordination with other relevant federal agencies, should establish a peak oil strategy to better prepare the United States for a peak and decline in oil production. Such a strategy should include efforts to reduce uncertainty about the timing of a peak in oil production and provide timely advice to Congress about cost-effective measures to mitigate the potential consequences of a peak.			x		x		x	x		x	x	x
	x		ENSI-4: The Federal Government should increase Corporate Average Fuel Economy (CAFE) to a level that will reduce our	x	x	x		x		x	x		x	x	x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			dependence on foreign oil and reduce greenhouse gas emissions.												
	x		ENSI-5: The Federal Government should develop a national consensus on alternative fuel research and development.		x	x		x		x			x		x
	x		ENSI-6: As recommended by the California Energy Commission, the state should continue to fund the Blueprint Planning Grant program and Blueprint Learning Network to assist regional agencies and local governments in developing regional growth plans. The grant program should include energy consumption and greenhouse gas emission reduction as primary outcomes of the blueprints developed within the program.	x	x	x	x	x	x	x			x	x	x
	x		ENSI-7: The Federal and State Government should promote clean, cost-effective, reliable, domestic renewable energy generation, such as solar power and wind turbines.		x	x	x	x	x	x			x		x
	x		ENSI-8: State and federal lawmakers and regulatory agencies should pursue the design of programs to either require or incentivize the expanded availability and use of alternative-fuel vehicles to reduce the impact of shifts in petroleum fuel supply and price.	x	x	x	x	x	x	x			x		x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
	x		ENSI-9: The State and Federal governments should encourage mileage-based vehicle insurance as a voluntary program. [Potential call-out box: When using a mileage-based insurance program, a vehicle's insurance premiums would be based directly mileage during the policy term. The more you drive the more you pay and the less you drive the more you save. For example, a $375 annual premium becomes 3¢ per mile, and a $1,250 annual premium becomes 10¢ per mile. An average U.S. motorist would pay about 6¢ per mile.]		x	x		x		x				x	
Local Government Strategies															
x			ENSI-10: Local governments should alter zoning to improve jobs/housing balance and creating communities where people live closer to work, bike, walk, and take transit as a substitute for personal auto travel.[iv]	x	x	x	x	x	x	x		x	x	x	x

[i] Multiple Benefits: The understanding of land use impacts on energy demand, energy generation and transmission, and on greenhouse gas emissions are in the early stages of exploration. Further research is necessary to understand how land use patterns can help reduce future vehicle miles traveled, carbon dioxide, particulate matter and parkland and habitat loss.

[ii] Multiple Benefits: There are various land use practices and building techniques that have been shown to reduce energy consumption and greenhouse gas emissions. For example, mixed land uses (i.e., residential developments near work places, restaurants, and shopping centers) with access to transportation have been shown to save consumers up to 512 gallons of gasoline per year. It is estimated that

households in transit-oriented developments drive 45 percent less than residents in auto-dependent neighborhoods. With this reduction, there is less overall energy consumption and less greenhouse gas emissions from personal vehicles. Encouraging the development of pedestrian corridors and bike trails that connect residents to work sites, shops, and recreational opportunities, communities can reduce personal vehicle use, fuel consumption and consequently improve air quality. Furthermore, land use patterns use resources more efficiently and reduce parkland and habitat loss.

[iii] There are various programs that promote green building such as the U.S. Green Building Council's Leadership in Energy and Environmental Design, Energy Star Homes, Green Point Rated Homes, and the California Green Builder Program. Green building standards go well beyond energy efficiency, involving usage of renewable resources and reduced waste generation and water usage. Such standards can reduce local environmental impacts, regional air pollutant emissions, and global greenhouse gas emissions.

[iv] Infill development encourages use of land in already developed areas as opposed to building new buildings on the outskirts. Infill involves the transformation of existing infrastructure to maximize their use potential. Infill development encourages building upwards instead of outwards. It takes advantages of unused areas and transforms them into, most typically, mixed use development. Most infill designs incorporate residential and commercial establishments in the same building. By using infill techniques, communities can save on the cost of new infrastructures and new roads. Infill projects give communities opportunities to expand while integrating new energy efficient standards.

Multiple Benefits: Successful infill development can offer these rewards for communities:

- provide housing (both affordable and market rate) near job centers and transit;
- increase the property-tax base;
- preserve open space at the edge of regions;
- provide new residents to support shopping districts and services;
- capitalize on community assets such as parks, infrastructure, and transit; and
- create new community assets such as child-care centers, arts districts, and shopping areas.

Resources

- Go Solar California: http://www.gosolarcalifornia.ca.gov
- Southern California Edison, Energy Efficiency Incentives: http://www.sce.com/RebatesandSavings
- Southern California Gas Company, Energy Efficiency Incentives: http://www.socalgas.com/energyefficiency/
- Federal Tax Incentives for Energy Efficiency: http://www.energystar.gov/

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[35] Renewable is defined as solar thermal, solar PV, wind, geothermal, biomass, and small hydro (less than 30 MW).
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Land Use and Housing

THE CHALLENGE

The region's challenges related to traffic congestion, air quality, housing availability and affordability and nearly all of the other issues identified in this plan can be traced, at least in part, to the intersection of land use decisions, transportation planning and the growth of our population and economy.

In a region where outward expansion has been the norm, there is now a perception that we are "built out," with little available land left to accommodate growth.

Complaints that new development is overburdening transportation infrastructure are becoming commonplace as traffic congestion and delay worsen.

California's system of municipal finance has forced local governments to make land use decisions based on revenue-generation concerns rather than sound planning practice.

Housing costs have skyrocketed as the supply of housing has failed to keep pace with a growing demand.

Commutes in many parts of the region are long and getting longer – indicative of a jobs-housing imbalance as people are forced to live far from where they work.

Linking Land Use and Transportation Planning

The quality of life in any region depends in large part on travel - how easy it is to get from home to work and back, the amount of time spent commuting, and the types and degree of choices available for getting around. Closely related to that are the choices we make about how land should be used. The types and appearances of buildings, how they function in a neighborhood or business district, and where they are located all have an effect on transportation use. For example, a small neighborhood that combines a shopping area with nearby residences makes it easier for people to walk for some of their trips. Highway-adjacent commercial development, however, tends to require auto travel for all trips.

At the same time, decisions made about transportation also affect what we build and where we build it. Freeway interchanges usually encourage development of auto-oriented stores and services, while transit and pedestrian amenities stimulate "Main Street" business and residential development nearby.

We are still growing – the region is expected to add another six million residents between 2005 and 2035. The new arrivals are members of our own growing families and those attracted by the strong regional economy and we can expect this growth regardless of the land use decisions we make. However, by linking responsible land use and transportation planning, we can accommodate growth while maintaining the region's mobility, livability, prosperity and sustainability.

THE PLAN

Sustainably planning for land use and housing in Southern California will maximize the efficiency of existing and planned transportation network, provide the necessary amount and mix of housing for our growing population, enable a diverse and growing economy and protect important natural resources.

We can achieve land use and housing sustainability by implementing the Compass Blueprint planning principles developed collaboratively by SCAG and other partners since 2000. Implementing Compass Blueprint will result in significant land use changes to only 2% of the total land area in the region. Implementation efforts, by all levels of

government and all stakeholders, are part of what is referred to as the "2% Strategy."

SCAG's transportation modeling and other analyses show that implementing the Compass Blueprint scenario will:

- Provide adequate and affordable housing for our growing population. Production of new housing units will provide an economic stimulus to the region through direct investment and new jobs.
- Promote improved jobs-housing balance throughout the region. Locating new housing near jobs, new employment centers near housing, and both housing and jobs near transit and other transportation corridors will shorten commutes and allow commuting options other than single occupancy vehicles.
- Reduce regional Vehicle Miles Traveled (VMT), resulting in reduced traffic congestion and delay and reduced air quality impacts. Reduced VMT will also lead to significant infrastructure cost savings (add quantified model/RTP results when available).
- Improve social equity and environmental justice through revitalization of older suburban and inner-city locations, promotion of economic development in urban core areas and enhancement of local property and sales tax revenues.

Development of the Compass Blueprint

The Compass Blueprint growth vision, 2% Strategy and the Goals, Outcomes and Action Plan outlined in this chapter are the products of a proactive and integrated process that began in 2000 with direction from SCAG's Regional Council and a region-wide series of workshops involving over 1500 stakeholders. SCAG's quantitative modeling and policy analysis techniques then determined some of the objective land use, transportation and economic implications of a range of alternative growth scenarios. By 2004, a regional consensus emerged on a growth vision/land use scenario that will enhance Southern California's livability, mobility, sustainability and prosperity.

The Compass Blueprint growth vision formed the basis for the preferred land use alternative in the 2004 Regional Transportation Plan. Continued technical analysis and a 2006 series of stakeholder workshops at which over 90% of the region's jurisdictions were represented, have resulted in an updated growth vision and a significantly refined scenario. This became the preferred land use alternative for the 2007-2008 Regional Transportation Plan and the foundation of the Land Use and Housing chapter of this Regional Comprehensive Plan.

Ultimately, the region should work together toward the outcome of realizing, by 2035, development and redevelopment consistent with the Compass Blueprint growth vision and the preferred land use scenario (check name consistency with RTP) developed for the Regional Transportation Plan through SCAG's Integrated Forecast program. The Compass Blueprint scenario describes a potential future for the region and distributes forecast growth in population and employment throughout the region. A palette of future development and redevelopment types ("city neighborhood" or "town center," for example), each with an associated density of households and jobs per acre, are mapped to specific locations, creating a scenario that can realistically accommodate the region's total forecast growth while maintaining or enhancing the region's mobility, livability, prosperity and sustainability.

The details of the scenario, including maps showing the locations of growth and tables describing the housing and employment densities and other attributes of the different development types, are presented in Appendix XYZ.

To accurately track implementation progress and assess consistency with the Compass Blueprint, SCAG will develop a monitoring plan and assessment methodology, as described below in the chapter's Action Plan.

Land Use and Housing Goals

Successfully integrate land and transportation planning and achieve land use and housing sustainability by implementing Compass Blueprint and 2% Strategy:

- Focusing growth in existing and emerging centers and along major transportation corridors.
- Creating significant areas of mixed-use development and walkable, "people-scaled" communities.
- Providing new housing opportunities, with building types and locations that respond to the region's changing demographics.
- Targeting growth in housing, employment and commercial development around existing and planned transit stations.
- Injecting new life into under-used areas by creating vibrant new business districts, redeveloping old buildings and building new businesses and housing on vacant lots.
- Preserving existing, stable, single-family neighborhoods.
- Protecting important open space, environmentally sensitive areas and agricultural lands from development.

Land Use and Housing Outcomes

- 100% of City and County General Plans consistent with Compass Blueprint by 2012. (General Plans are the local blueprints for growth and the best indicator of local governments' having adopted Compass Blueprint planning principles.)
- Significantly increase the number and percentage (revise with precise values resulting from RTP scenario modeling) of new housing units and jobs created within the Compass 2% Strategy Opportunity Areas should be by 2012 and improve the regional jobs-housing balance. (Tracking the number or new units will measure the region's progress in accommodating forecast growth. Percentage of housing and jobs developed within the Opportunity Areas will indicate the locational efficiency of growth.)
- Reduce total regional vehicle miles traveled (VMT) from carbon-based fueled vehicles to 1990 levels by 2020. (The Land Use and Housing Action Plan can be expected to result in a 10% reduction in VMT per household by 2035. VMT serves as a proxy for jobs/housing balance, urban design, transit accessibility, and other urban form issues. VMT per household will decrease with Compass Blueprint implementation.)
- Add one new housing unit to stock for every 3 persons in population growth and one new housing unit for every 1.5 jobs. (Housing supply measures the availability of housing in comparison to population and jobs.)

- Reduce the percentage of households paying more than 50% of income for by 20% from the year 2000 level. (Combined housing and transportation costs asa percentage of income is an important measure of housing affordability and efficient development.)
- Increase the region's first-time homebuyer affordability index so that the relationship of minimum qualifying income to entry-level home price mirrors the national average. (The first-time homebuyer affordability index is another key measure of housing affordability.)
- Increase regional homeownership so that the percentage of households owning their own home mirrors the national average. Reduce the existing disparities in homeownership by ethnic group by 50%. (The region currently suffers from low homeownership rates, especially among certain ethnic groups.)
- Achieve a regional housing vacancy rate of 1.5% for owner-occupied units and 5% for rental units. (These vacancy rates are indicators of a healthy housing market.)
- Significantly increase the density of urbanized areas between 2007 and 2035. (Urban Density measures the density of housing units in parts of the region that are already urbanized or that become urbanized during the planning period.)
- Significantly decrease the rate of land consumption and urbanization between 2007 and 2035. (Land consumption and urbanization measures the rate at which undeveloped land is converted to urban uses, relative to population growth.)
- All cities in the region adopt green building standards by 2012. (Green Building standards as part of local planning and permitting represents a key element of the Compass Blueprint Growth Vision – sustainability. Green Building will also be a key to achieving the sustainability goals identified in the Water, Solid Waste, Energy and Air Quality chapters of this RCP.)

LAND USE AND HOUSING ACTION PLAN

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Policies															
x			LUH-1. Provide technical assistance and regional leadership to implement the Compass Blueprint growth scenario and integrate growth and land use planning with the existing and planned transportation network.	x	x	x		x	x	x			x	x	x
x			LUH-1.1 SCAG shall provide planning services to local governments through Compass Blueprint Demonstration Projects. These projects will help local jurisdictions: • Update General Plans to reflect Compass Blueprint principles and integrate land use and transportation planning. • Develop specific plans, zoning overlays and other planning tools to enable and stimulate desired land-use changes within 2% Strategy Opportunity Areas. • Complete the economic analyses and community involvement efforts that will ensure that the planned changes are market-feasible and responsive to stakeholder concerns. • Visualize potential changes, through innovative graphics and mapping	x	x	x		x	x	x			x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			technology, to inform the dialogue about growth, development and transportation at the local and regional level												
		x	LUH-1.2 SCAG shall continue with a targeted public relations strategy that emphasizes regional leadership, the benefits and implications of Compass Blueprint, and builds a sense of common interests among Southern Californians.	x	x	x		x	x	x			x	x	x
		x	LUH-1.3 SCAG shall expand the role of the Compass Partnership, a forum convening representatives from government, civic leaders and members of the development community. The Compass Partnership will advise the region on how public-private partnerships will help leverage the outcomes outlined in this chapter.	x	x	x		x	x	x			x	x	x
x			LUH-2. Leverage federal and State and local funds to implement the Compass Blueprint.	x	x			x	x	x			x	x	x
x			LUH-2.1 All stakeholders should leverage state infrastructure bond financing, including the Department of Housing and Community Development's Transit Oriented Development program and should support legislation that will target infrastructure bond funds for regions with adopted growth visions such as	x	x			x	x	x			x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			the Compass Blueprint and for projects consistent with these visions.												
x			LUH-3 SCAG shall develop an objective monitoring system to gather data and measure regional progress toward implementing the Compass Blueprint growth scenario and achieving the outcomes outlined in this chapter.	x	x	x		x	x	x			x	x	x
x			LUH-3.1 SCAG shall define a methodology for assessing local General Plans' consistency with Compass Blueprint.	x	x	x		x	x	x			x	x	x
x			LUH-3.2 SCAG shall develop a data set and methodology for determining what portion of regional growth is occurring within 2% Strategy Opportunity Areas.	x	x	x		x	x	x			x	x	x
x			LUH-3.3 SCAG shall further develop land use performance measures to be included in future Regional Transportation Plans.	x	x	x		x	x	x			x	x	x
x			LUH-4 SCAG shall use its Intergovernmental Review process (IGR) role to provide robust review and comment on large development projects and their consistency with the Compass Blueprint.	x	x	x		x	x	x			x	x	x
Local Government Policies															
x			LUH-5 Local jurisdictions should provide for new housing, consistent with state Housing	x						x				x	

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			Element law, to accommodate their share of forecast regional growth.												
x			LUH-5.1 Local jurisdictions should adopt and implement General Plan Housing Elements that accommodate the housing need identified through the Regional Housing Needs Assessment (RHNA) process. Affordable housing should be provided consistent with the RHNA income category distribution adopted for each jurisdiction. To provide this housing, especially affordable housing, jurisdictions should leverage existing state programs such as HCD's Workforce Incentive Program and the state density bonus law and create local incentives such as housing trust funds, inclusionary zoning, tax-increment-financing districts in redevelopment areas and around transit villages and partnerships with non-governmental stakeholders.	x	x	x		x	x	x				x	x
x			LUH-6 Leverage federal and State and local funds to implement the Compass Blueprint.	x	x	x		x	x	x			x	x	x
x			LUH-6.1 All stakeholders should leverage state infrastructure bond financing, including the Department of Housing and Community Development's Transit Oriented Development	x	x	x		x	x	x			x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			program and should support legislation that will target infrastructure bond funds for regions with adopted growth visions such as the Compass Blueprint and for projects consistent with these visions.												
x			LUH-6.2 Subregional organizations should leverage the federal transportation planning funds available at the subregional level, to complete projects that integrate land use and transportation planning and implement Compass Blueprint principles.	x	x	x		x	x	x			x	x	x
x			LUH-7 Local communities should consider shared regional priorities, as outlined in the Compass Blueprint, Regional Transportation Plan, and this Regional Comprehensive Plan, in determining their own development goals and drafting local plans.	x	x	x	x	x	x	x	x	x	x	x	x
x			LUH-7.1 Local jurisdictions should take a comprehensive approach to updating their General Plans, keeping General Plans up-to-date and providing progress reports on General Plan updates and implementation, as required by law. Communities are strongly encouraged to submit the General Plan and General Plan elements to SCAG under the Inter-Governmental Review Program.	x	x	x	x	x	x	x	x	x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
x			LUH-7.2 Local governments should adopt, with technical assistance from the state and SCAG, green building standards.	x		x	x	x		x		x	x	x	x
x			LUH-7.3 Local governments and subregional organizations should develop ordinances and other programs, particularly in the older, more urbanized parts of the region, which will enable and assist in the cleanup and redevelopment of brownfield sites.	x	x	x		x	x	x		x	x	x	x
x			LUH-7.4 Local governments and subregional organizations should develop adaptive reuse ordinances and other programs that will enable the conversion of vacant or aging commercial, office, and some industrial properties to housing and mixed use with housing.	x	x	x		x	x	x		x	x	x	x
Federal and State Government Policies															
	x		LUH-8 The state should continue to support and provide funding for the statewide Blueprint Planning program.	x	x	x	x	x	x	x	x	x	x	x	x

IGR/Best Practices	Legislation	Coordination	Strategic Initiative	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Initiatives															
	x		LUHSI-1 SCAG and county transportation commissions should initiate a program to secure significant resources for implementing Compass Blueprint. The program would provide infrastructure funding for specific allowable costs of development projects that integrate land use and transportation planning and are consistent with the 2% Strategy.	x	x	x		x	x	x			x	x	x
	x		LUHSI-2 SCAG shall continue efforts, in collaboration with state agencies and local jurisdictions, to significantly reform state Housing Element law and the Regional Housing Needs Assessment process. These reforms should promote the broad goals stated by the Secretary of Business, Transportation and Housing and shared by SCAG: • Each municipality has a clear responsibility to provide housing based on the growth in population and jobs generated in the community. • Jurisdictions should be able to collaborate in meeting housing needs. • Planning for housing should be pursued over a longer time frame in line with other major growth planning efforts.	x						x				x	

IGR/Best Practices	Legislation	Coordination	Strategic Initiative	Potential for Direct/Indirect Benefits: Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Other Benefits: Public Health	Environmental Justice	Climate Change
Federal and State Government Initiatives															
	x		LUHSI-3 The State, in collaboration with SCAG, other regional organizations and local jurisdictions, should work to re-structure and re-incentivize the municipal finance system that currently challenges virtually all local governments in California and often promotes inefficient land uses. Changes should: • Ensure the reliability of revenue streams to local government such that local finances are not the first resort in difficult budget years. • Re-structure sources of municipal revenue to place less emphasis on retail development and sales tax receipts, and to incentivize housing development and other land use changes consistent with regionally shared goals.	x						x						

Open Space and Habitat

THE CHALLENGE

As the SCAG region rapidly urbanizes open space resources that enhance quality of life and provide environmental benefit are disappearing. In areas where development abuts natural lands or agricultural lands, these resources are often lost to make room for new development or to accommodate services for existing development. Many cores and linkages are unprotected. In urbanized areas, open space resources such as parks, trails and greenbelts are often scarce.

Currently, our region is experiencing unprecedented development and our open spaces will suffer the consequences of inaction. Already, in the most urbanized areas of the region, there is more developed land than natural lands, parks, and farmland combined. Although, there is a seeming abundance of private vacant lands and even farmlands in the slowly urbanizing and rural areas, the actions taken in urbanized areas have already impacted open space throughout the region:

- The extirpation of species in one part of the region leads to federal and/or state listings affecting areas where these species still occur.
- The loss and degradation of special habitats (wetlands, riparian, sage scrub, and native grasslands) from past development leads to region-wide regulations. Development, past and present, continues to affect water quality and watershed conditions throughout the region.
- Our transportation system created many of the development patterns that exist today. This system crosses almost all large tracts of open space outside of urban areas, impeding wildlife movement. In areas where development has also occurred, wildlife linkages have been narrowed or severed. Based on a statewide assessment, there at least 72 linkages at risk of being severed by existing and projected development.
- Agricultural lands exceeded developed lands in the existing urban core and in outlying areas until relatively recently. Both the rate and amount of conversions to non-farm uses continues to increase. For the first time in its history, it appears the region may have more developed lands than agricultural lands.

Three categories of open space are addressed in this chapter, all of which have common attributes such as aesthetic, air quality, and water quality benefits. Each also offers unique benefits:

- **Natural Lands**: These are generally undeveloped and/or vacant lands with some natural vegetation and/or wildlife value, including lands used for grazing. These lands may include large and small blocks of habitat and the open space that links those blocks together. This includes habitat that has some level of existing protection (protected open space) or needs to be protected to preserve the ecological function and value of protected open space, especially areas that serve as wildlife linkages and areas with sensitive habitats not covered by existing conservation programs;
- **Community Open Space**: This includes areas that enhances the quality of life in urban areas and completes interconnected networks of parks, trails, greenbelts, community gardens, and urban forests serving the region's communities; and
- **Farmlands**: This category includes prime farmland, farmland of statewide importance, unique farmland

and farmland of local importance as defined by the California Department of Conservation. They provide food, products and economic benefits to the region and include the region's remaining prime and other important agricultural lands, especially farmlands intertwined with unprotected natural lands and developing communities.

There are numerous plans and programs throughout Southern California that attempt to conserve open space resources. Examples include:

- An open space element in a city or county general plan
- Natural community conservation plan (NCCP) and habitat conservation plan (HCP)
- Mandated management plans for public lands, such as the Southern California Forest Plan and California Desert Conservation Area Plan
- Integrated watershed management plans
- Open space acquisition and habitat enhancement programs implemented by the California Resource Agency, Conservancies, non-profit organizations and trusts
- Resource specific conservation strategies, such as South Coast Missing Linkages
- Open space and parkland acquisition programs implemented by public-private partnerships and individual conservancies
- Open space planning strategies and initiatives such as Green Visions

While these plans address open space issues, they do not individually fulfill the need for a more holistic regional approach, one which evaluates the collective needs of the six-county SCAG region. SCAG's approach is to create a cohesive vision and a comprehensive open space strategy by tying together these plans and identifying additional opportunities for conservation.

Open Space Resources

Natural Lands: Undeveloped vacant land with natural vegetation, including lands used for grazing; lands with wildlife habitat.

Community Open Space: Public open space in or serving communities, such as park and recreation areas, community gardens, dedicated open space, urban forests, greenbelts, and trail systems.

Farmland: Prime farmland, farmland of statewide importance, unique farmland, and farmland of local importance.

THE PLAN

The overall focus of this chapter is to plan and provide for the conservation of the region's open space resources focusing on

- Interconnections among resources
- Future land use decisions that will either strengthen or impair the region's ability to sustain the resources, and
- Opportunities for inter-jurisdictional planning

The intent is to conserve the region's open space resources in a way that will ensure sustainability over time. To help guide this effort, open space resources have been grouped into three categories: natural lands, community open space and farmlands and rangelands.

SCAG's role will be to:

- Maintain the regional open space database and use it

to track progress in attaining regional open space conservation goals;

- Integrate the policies and actions herein into its existing transportation planning, growth forecasting, intergovernmental review, and legislative programs, and expand its capacity to provide technical services for open space planning;
- Establish a regional forum for coordinating existing programs and initiating new cooperative efforts; and
- Work in cooperation with its member agencies and open space conservancies in the region to find ways to supplement existing funding sources for open space conservation.
- Include open space mitigation policies and/or mitigation recommendations in the RTP;
- Link funding for planning and/or transportation projects to comply with SCAG's open space program
- Use the inter-governmental review process to address the open space impacts of regionally significant projects;
- Be a regional clearinghouse for data, funding information, program coordination;
- Propose legislative solutions; and
- Use its position as a regional planning agency to create and secure additional funding for open space conservation in the region.

SCAG's member agencies will be asked to:

- Propose and participate in cooperative conservation planning efforts;
- Adopt the regional open space policies presented in the program and apply those policies in planning and reviewing projects
- Provide updated information on local open space resources for inclusion in the regional open space database

Local conservancies and other interested parties will be invited to:

- Propose and participate in cooperative efforts with SCAG member agencies
- Provide updated information on local open space resources for inclusion in the regional open space database.

The goals and outcomes included in this chapter focus on the conservation of regionally significant open space resources. To that end, SCAG completed a comprehensive evaluation of open space resources in the region and its neighboring counties. Geographic Information System (GIS) data were collected from existing sources to assist with and inform the evaluation of open space planning issues. These data were evaluated and analyzed to show the distribution of existing open space resources, levels of existing and planning protection and areas of key habitat linkages. When available, the SCAG data collected and presented as part of this effort was for the entire region, and includes Kern and San Diego Counties.

NATURAL LANDS

The sustainability of natural lands is directly related to maintaining large blocks of habitat (also called "cores"), keeping them relatively impervious to outside disturbance and allowing wildlife linkages to function. This network of large cores and wildlife linkages are part of an ecosystem

where plants and animals occur in populations large enough that little human intervention is needed and natural ecological processes (predation, competitive interaction, natural disturbance and recovery) operate so that evolution is sustained. This vast connected landscape provides a sense of place and spiritual renewal that cannot be provided elsewhere. This network recharges the region's watershed and water resources while combating the effects of air pollution and global warming.

Except for northern Ventura County, all natural lands in the SCAG region occur within three of the nine bioregions in Southern California: South Coast, Mojave Desert and Colorado Desert. Bioregions are areas that include multiple ecological communities based on common physical (climate, geology) biological (vegetation, wildlife) and environmental conditions. Northern Ventura County is unique in that it forms the southeast tip of the Central Coast bioregion and is located where five bioregions converge.

Many of the natural lands in the Southern California bioregions are large interconnected cores. However, near developed areas and along the regional highways, connections between large tracts of natural lands have been narrowed and fragmented and in some places permanently severed. Wildlife movement corridors, or wildlife "linkages," are an important component of natural lands. Southcoast Wildlands, a nonprofit organization, evaluated and identified 70 linkages in the SCAG region as areas where natural connectivity is at risk.

One way to determine the overall need for a regional planning effort such as the one SCAG has undertaken is to evaluate the current levels of "protection" for lands in the region, particularly natural lands.[1] This helps to provide a regional context for planning by showing the existing pattern of what is protected and what is not thereby, helping to identify those areas where open space resources are most at risk. Concurrent with this mapping effort, existing plans and programs were reviewed to identify which areas are covered by conservation strategies and which are not.

Figure 1 shows the distribution of many key open space resources including "protected" and "unprotected" cores, connectors and fragments within the SCAG region and its vicinity. It also shows the location of the protected and unprotected areas in relation to wildlife linkages, linkage design areas, park and recreation areas (from SCAG's 2005 land use inventory) agricultural lands, and developed lands together, these form the region's open space infrastructure. Linkages, cores and connectors exist intra-county and inter-county; they often cross county lines and from the SCAG region into Kern and San Diego Counties.

By evaluating the open space resources identified in Figure 1, SCAG identified those areas with high potential for conservation, particularly areas where cross jurisdictional opportunities exist. Examples of cross jurisdictional opportunities include areas where linkages cross a county boundary, or cross the boundaries of the SCAG region. Generally, these areas do not fall within the limits of any one jurisdiction, and as such provide an appropriate focus for a regional scale document. Figure 2 provides examples of possible conservation opportunity areas; these are areas where mitigation for impacts of regionally significant project and/or conservation efforts by public and private entities should be directed. Although SCAG does not have the authority to purchase or manage lands, conservation of these areas will be achieved through already established programs or through compacts facilitated by SCAG.

Figure 1 Regional Open Space Resources

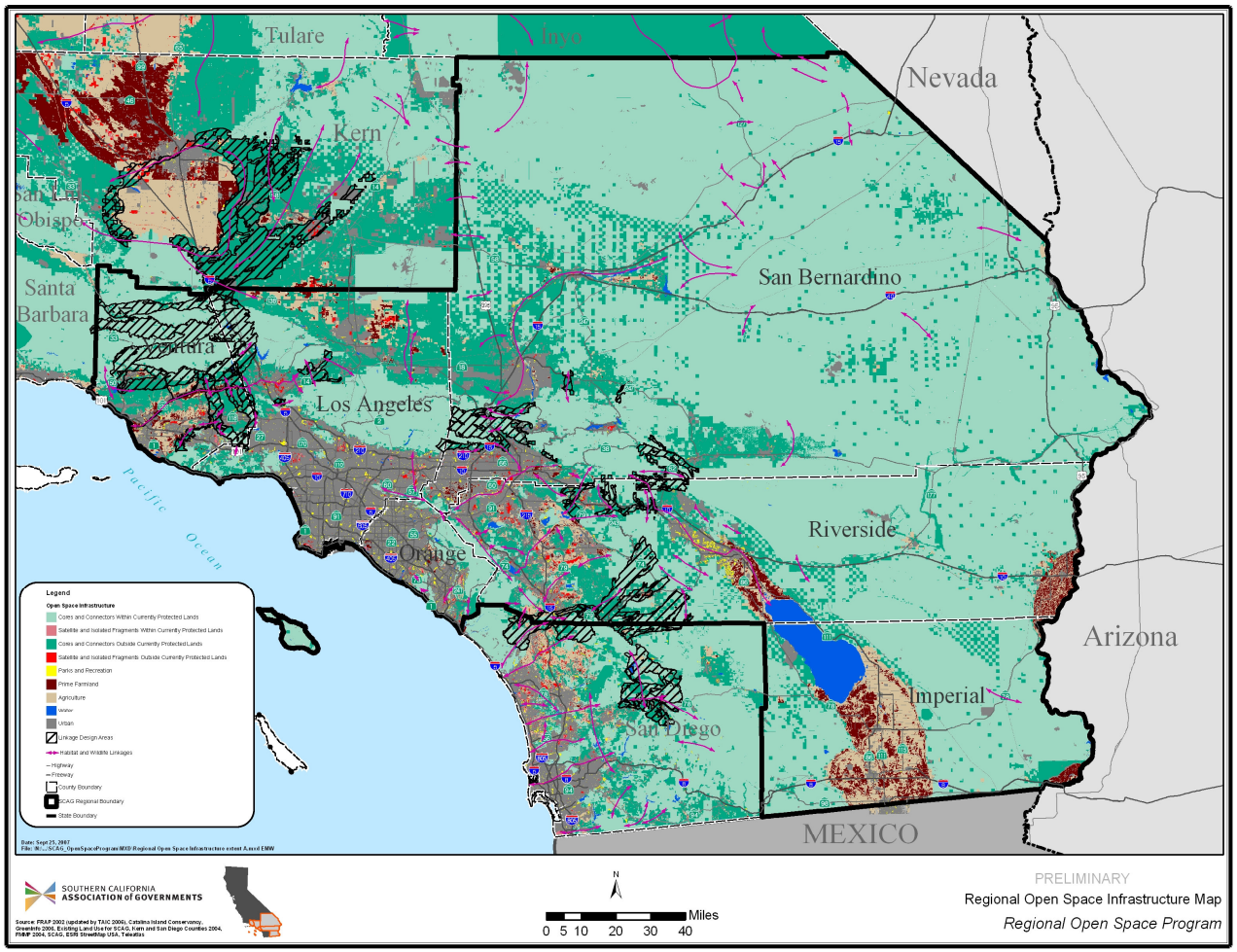
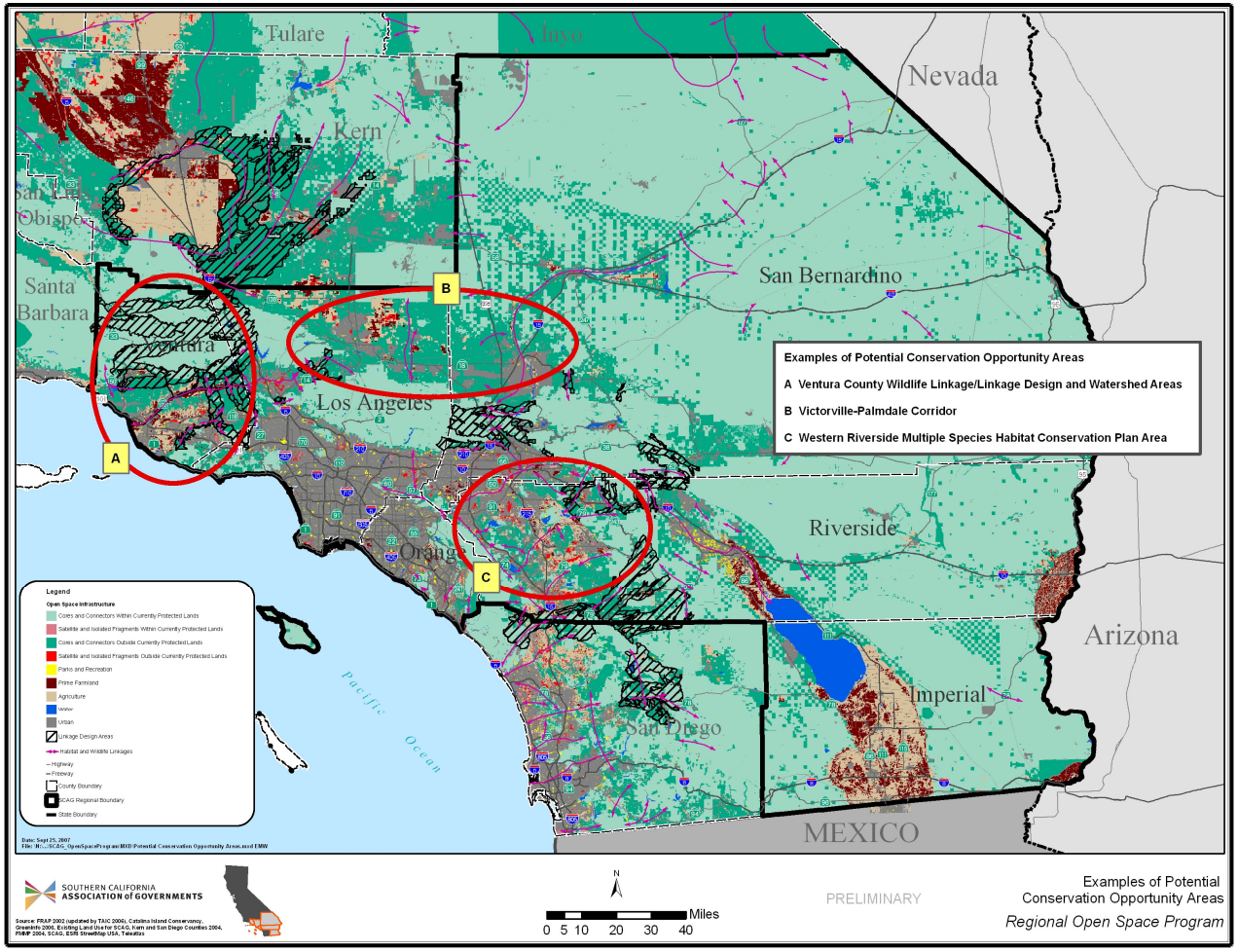


Figure 2 Conservation Opportunity Areas



Working Draft

Open Space and Habitat–Natural Lands Goals

- Ensure a sustainable ecology by protecting and enhancing the region's open space infrastructure and mitigate growth and transportation related impacts to natural lands by:
    - Conserving natural lands that are necessary to preserve the ecological function and value of the region's ecosystems;
    - Conserving wildlife linkages as critical components of the region's open space infrastructure;
    - Coordinating transportation and open space to reduce transportation impacts to natural lands

Open Space and Habitat–Natural Lands Outcomes

- By 2035, increase the amount of protected open space in the region by at least 700,000[2] acres of natural lands that include important core areas,[3] wildlife linkages, have special status habitats or species and/or buffer protected natural lands from development. The number of acres protected would be roughly proportionate to the urban footprint of the 2004 Regional Transportation Plan.
- By 2012, put in place approved conservation strategies for all regionally significant wildlife linkages.

OPEN SPACE AND HABITAT–NATURAL LANDS ACTION PLAN

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Policies															
		x	OSHNL-1 Track and monitor open space conservation efforts in the region. • SCAG shall set up a clearinghouse of important GIS data used for open space planning. SCAG shall maintain and update the regional open space database, track open space conservation and development (e.g. any activity that reduces the biological value of natural lands compared to baseline conditions) in the region and will commit to providing annual updates on conservation efforts.	x	x	x	x	x	x				x	x	x
x		x	OSHNL-2 Use SCAG's Intergovernmental Review (IGR) process to comment on regional projects. • SCAG shall establish criteria for evaluating impacts to regionally significant open space resources, and will recommend mitigation measures for significant impacts to regional resources. These recommendations will be included in SCAG's Regional Open Space Guidance. • SCAG shall establish criteria for evaluating	x	x	x	x	x	x	x			x		x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			impacts to regionally significant open space resources, and will recommend mitigation measures for significant impacts to regional resources. These recommendations will be included in SCAG's Regional Open Space Guidance. • Priority review will include 1) existing and proposed General Plans and 2) any individual project that will have a significant impact on natural open space.												
x			OSHNL-3 Develop and implement mitigation for open space impacts • SCAG shall develop and implement coordinated mitigation programs for regional projects, with an emphasis on regional transportation projects. • SCAG shall produce and maintain a list/map of potential conservation opportunity areas. These conservation opportunity areas may be used by local governments and project sponsors as priority areas for mitigating impacts to open space resources. (see *Regional Open Space Guidance* for a complete description of Conservation Opportunity Areas) • SCAG shall work in partnership with state	x	x	x	x		x				x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			and federal agencies, local conservancies and other groups to conserve natural lands in key locations through existing conservation programs, mitigation for the impacts of regional projects and conservation compacts facilitated by SCAG. • SCAG shall work with County Transportation Commissions and Caltrans to refine the proposed open space consistency guidelines as necessary.												
x			OSHNL-4 SCAG shall support policies and actions that preserve natural areas, specifically those areas identified in local, state, and federal plans.	x		x	x		x				x		x
x			OSHNL-5 SCAG shall support the protection of vital resources such as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals.	x		x	x		x				x		
x			OSHNL-6 SCAG shall encourage the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites	x					x					x	

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
x			OSHNL-7 SCAG shall encourage "watershed management" programs and strategies, recognizing the primary role of local governments in such efforts	x	x	x	x	x	x				x		
x			OSHNL-8 SCAG shall support regional efforts to identify and cooperatively plan for wetlands to facilitate both sustaining the amount and quality of wetlands in the region and expediting the process for obtaining wetlands permits.	x			x		x				x		
x			OSHNL-9 SCAG shall support and work with communities and research entities on developing measures of the economic value of natural lands.	x		x	x		x	x					
x		x	OSHNL-10 Integrate open space assumptions into the Regional Growth Forecast • SCAG shall prepare growth forecasts for the region that are based on assumptions that accurately reflect allowed uses on 1) existing designated open space 2) areas subject to regulations that preclude or limit uses and 3) areas where some or all of the lands are proposed for preservation under approved conservation programs.	x	x		x		x	x				x	x
	x	x	OSHNL-11 Seek funding for conservation of natural lands	x			x		x	x				x	

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			• SCAG shall partner with local agencies and non-profit foundations in situations where a regional entity is necessary to secure funds. • SCAG shall seek support (financial, technical, etc) at the state and federal level for a prototype regional open space database program.												
Local Government Policies															
x			OSHNL-12 Track and Monitor Open Space Conservation • Local governments should consider the most recent annual report on open space conservation in planning and evaluating projects and programs in areas with regionally significant open space resources. • Local governments should be consistent with the open space conservation policies and goals of the RCP to be eligible for future funding opportunities and programs administered by SCAG.	x	x	x	x	x	x	x		x	x	x	x
x			OSHNL-13 Develop and implement mitigation for open space impacts • Local governments and conservation organizations shall promote coordinated	x	x		x		x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			mitigation programs for regional projects and establish the basis for inter regional conservation strategies. • Local governments should plan development in locations least likely to cause environmental impact.												
Project Sponsor and Developer Policies															
x			OSHNL-14 Develop and implement mitigation for open space impacts • Individual projects submitted for IGR review should either avoid significant impacts to regionally significant open space resources or mitigate the significant impacts through measures consistent with regional open space policies for conserving natural lands, community open space and farmlands. All projects submitted for IGR review shall demonstrate consideration of alternatives that would avoid or reduce impacts to open space. • Individual projects should include into project design, to the maximum extent practicable, mitigation measures and recommended best practices aimed at minimizing or avoiding impacts to natural lands, including, but not limited to FHWA's	x	x		x		x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			Critter Crossings, and Ventura County Mitigation Guidelines. • Project level mitigation for RTP's significant cumulative and growth-inducing impacts on open space resources will include but not be limited to the conservation of natural lands, community open space and important farmland through existing programs in the region or through multi-party conservation compacts facilitated by SCAG. • Project sponsors should ensure that transportation systems proposed in the RTP avoid or mitigate significant impacts to natural lands, community open space and important farmland, including cumulative impacts and open space impacts from the growth associated with transportation projects and improvements. • Project sponsors should ensure that at least one acre of unprotected open space is permanently conserved for each acre of open space developed as a result of growth that accompanies transportation projects/improvements.												

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Initiatives															
		x	OSHNLSI-1 SCAG shall seek to develop cooperative agreements and multi party conservation compacts to accelerate the conservation of natural lands in the region.	x	x	x	x		x	x			x	x	x
	x		OSHNLSI-2 SCAG shall put in place an open space funding program to demonstrate to state/federal agencies that SCAG is prepared to serve as the regional entity to distribute state/federal funds for open space conservation.	x	x		x		x	x			x	x	x
	x		OSHNLSI-3 SCAG shall seek to create new sources of funding for open space conservation.	x	x		x		x	x				x	x
x			OSHNLSI-4 SCAG shall establish decision-making tools for identifying and prioritizing open space conservation projects, such as those by the San Diego Association of Governments (SANDAG) in distributing funding through the Transnet Environmental Mitigation Program (EMP).	x	x	x	x		x	x			x	x	x
x			OSHNLSI-5 SCAG shall establish criteria for evaluating impacts to regionally significant open space resources, and will recommend mitigation measures for significant impacts to regional resources. These recommendations	x	x	x	x		x	x			x	x	x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			will be included in SCAG's Regional Open Space Guidance.												
	x		OSHNLSI-6 SCAG shall develop Memoranda of Understanding with state and federal resource agencies as necessary to facilitate the conservation of natural lands.	x	x		x		x	x			x	x	x

COMMUNITY OPEN SPACE

Community open space exists in or serves developed communities. Examples include park and recreation areas, community gardens, dedicated open space, urban forests, greenbelts and trail systems. Sustainable community open space is accessible by alternative modes of transportation, whether on foot, on bicycle, or by riding transit. It is distributed so that it serves a wide range of user groups in the region, from children to seniors and features amenities that meet the recreation and outdoor needs of its diverse users. Sustainable community open space also fulfills multiple planning and quality of life objectives contributing to watershed and water quality, air quality management and public health.

Parks and Public Health

A 1996 report by the U.S. Surgeon General found that people who engage in regular physical activity benefit from reduced risk of premature death; reduced risk of coronary heart disease, hypertension, colon cancer, and non-insulin dependent diabetes; improved physical functioning in persons suffering from poor health; and healthier cardiovascular, respiratory and endocrine systems. Physical activity also produces important psychological benefits relieving symptoms of depression and anxiety; improving mood and enhancing psychological well being.[4]

The link between obesity and community open space is particularly relevant. Over the last decade, California has experienced one of the fastest rates of increase in adult obesity of any state in the nation.[5] More than half of California adults now are overweight or already obese. Rates among African American and Latino adults, men over age 25 years, and adults with less than a high school education exceed 60 percent and there is no sign that the increases in obesity are slowing.[6]

The effects of obesity are putting a strain on the health care system and adding additional costs in loss of productivity. Estimated costs in California attributable to physical inactivity, obesity and overweight in 2005 were projected to reach $28 billion. A ten percent improvement – just one person of ten who becomes more active and maintains a healthy weight over a five-year period – could result in savings of nearly $13 billion.[7]

A report published by The Trust for Public Land concluded that strong evidence shows that when people have access to parks, they exercise more.[8] In a study published by the CDC, creation of or enhanced access to places for physical activity led to a 25.6 percent increase in the percentage of people exercising three or more days per week. The study also found that obesity is more likely in unwalkable neighborhoods, but rates of obesity go down as measures of walkability go up.[9]

SCAG evaluated the community open space availability in 16 cities in the region and compared them to the National Recreation and Parks Association standards recommended for park types.[10] As measured against NRPA's overall parks to people standard (6.25-10 acres/1,000 people) three cities exceeded the standard (Irvine, Pomona and Ventura) while the rest of the cities fell below the standard. Table 1 shows the results for each of the cities.

Levels of Service

As shown in Table 1, the range of acres of parkland per 1,000 people varies greatly throughout several cities. Although, NPRA standards may be helpful to get a general understanding of availability of parkland in a particular city, these standards were developed in the 1930s and fail

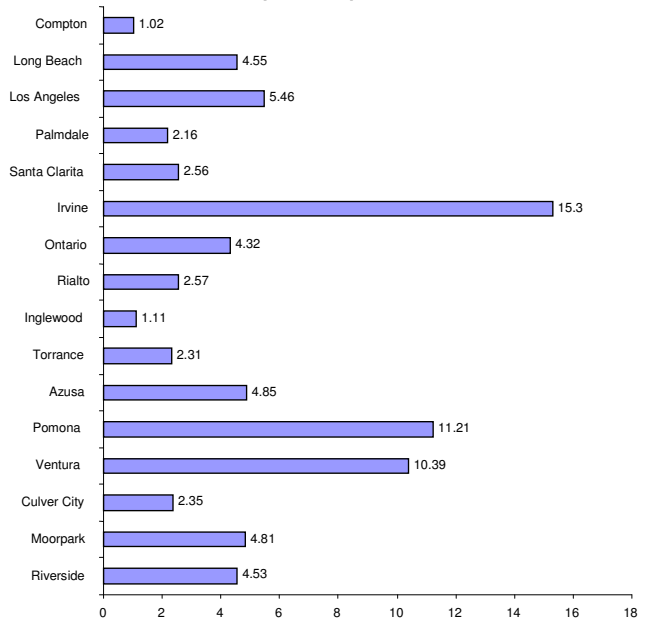
to reflect the dynamic environment and variety of today's communities. For instance, NPRA standards do not address access nor do they include many types of open space common in urban environments such as urban forests, greenbelts and trails. For that reason, SCAG is encouraging communities to utilize a new paradigm such as Levels of Service (LOS) to measure park needs for their communities. Generally, the LOS paradigm takes into account the following factors:[11]

- existing open space plans and policies (general plan open space element, parks and recreation plan, watershed management plan)
- community preference as ascertained by survey, questionnaire and public workshop
- accessibility by underrepresented groups and underserved populations, including low income or below poverty level communities, underrepresented ethnic groups, children, seniors, disabled individuals and those who are transit dependent
- multi-modal transportation access within ½ mile
- multi purpose, multi-function open space, such as river parks
- multi agency initiatives that cover broad geographic areas; and
- Compass Blueprint areas

LOS can be assigned similar to the system used in traffic analysis with ranking of "A" for excellent through "E" for failing. A community with a preponderance of these types of criteria provides a higher level of service

Table 1

Parks-to-People Ratio per 1,000 residents



OPEN SPACE AND HABITAT–COMMUNITY OPEN SPACE GOALS

- Enhance the region's parks, trails and community open space infrastructure to support the aesthetic, recreational and quality-of-life needs, providing the highest level of service to our growing region by:
    - Creating new community open space that is interconnected, accessible, equitably

distributed and provides public health benefits;

- Improving existing community open space through urban forestry and other programs that provide environmental benefits.

Open Space and Habitat–Community Open Space Outcomes

- By 2035, all SCAG subregions have community open space systems that have an "above average" level of service (LOS).
- An "above average" LOS for community open space, by 2012, in areas that participated in SCAG's Compass Blueprint demonstration projects.
- From 2007 conditions, increase the percentage of transit trips that can access community open space in one hour or less by 2012.

OPEN SPACE AND HABITAT–COMMUNITY OPEN SPACE ACTION PLAN

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Policies															
		x	OSHCOS-1 Enhance community open space and its accessibility	x	x	x	x	x	x				x	x	x
x			OSHCOS-2 SCAG shall include a strategy for providing and conserving open space into all Compass Blueprint demonstration projects initiated after approval of the RCP.	x	x	x	x	x	x	x		x	x	x	x
		x	OSHCOS-3 SCAG and its member agencies will work with open space experts and community interest groups to develop a Level of Service ranking and evaluation system for community open space in the region.	x	x	x		x	x	x			x	x	x
		x	OSHCOS-4 SCAG shall support local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection.	x	x	x		x						x	x
		x	OSHCOS-5 SCAG shall encourage member jurisdictions to work as partners to address regional outdoor recreation needs and to acquire the necessary funding for the	x		x	x		x				x	x	

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			implementation of their plans and programs.												
		x	OSHCOS-6 SCAG shall encourage member jurisdictions that have trails and trail segments determined to be regionally significant to work together to support regional trail networks. SCAG shall encourage joint use of utility, transportation and other rights-of-way, greenbelts, and biodiversity areas.	x	x	x		x	x	x			x	x	x
Local Government Policies/Project Sponsor and Developer Policies															
x			OSHCOS-7 Local governments should prepare a Needs Assessment to determine the adequate community open space level for their areas.	x	x	x	x	x	x	x		x	x	x	x
x			OSHCOS-8 Local governments should encourage patterns of urban development and land use, which reduce costs on infrastructure and make better use of existing facilities.	x	x	x	x	x	x	x		x	x	x	x
x			OSHCOS-9 Local governments should increase the accessibility to natural areas lands for outdoor recreation.	x	x	x	x	x	x				x	x	x
x			OSHCOS-10 Local governments should promote infill development and redevelopment to revitalize existing communities.	x	x	x	x	x	x	x			x	x	x
x			OSHCOS-11 Local governments and project sponsors should utilize "green" development techniques.	x	x	x	x	x	x	x		x	x		x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
x			OSHCOS-12 Local governments and project sponsors should promote water-efficient land use and development.	x	x	x	x	x	x	x		x	x		x
x			OSHCOS-13 Local governments and project sponsors should encourage multiple use spaces and encourage redevelopment in areas where it will provide more opportunities for recreational uses and access to natural areas close to the urban core.	x	x	x	x	x	x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits: Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Other Benefits: Public Health	Environmental Justice	Climate Change
SCAG Initiatives															
		x	OSHCOSSI-1 SCAG will work with all subregions, counties and cities to prepare needs assessments and develop and refine LOS criteria (see Appendix X). The criteria established through the RCP and ancillary efforts will also be used as criteria for statewide bond funding	x	x	x	x	x	x	x		x	x	x	x

AGRICULTURAL LANDS

Sustainable farmlands are open spaces that maintain food production for the region and are protected from urban encroachment. Conserving sustainable farmland is essential to the overall region as these lands play a key role in maintaining the interconnections of natural lands, community open space and farmlands.

California farmers and ranchers represent a diverse group of individual businesses, with great diversity in farm size and revenue. While globally, exports of agricultural products remain a key driver of agricultural profitability, new market incentives in areas such as renewable energy for production and the development of technologies to convert raw materials into "biofuels" can expand profitability and environmental sustainability opportunities for farmers.

Table 2 indicates the importance of agricultural lands to the region as demonstrated by the gross value of products sold. Based on the 2002 USDA Census of Agriculture, county level data, Imperial, Ventura and Riverside Counties round out the top ten producing counties in the state, each with more than one billion in gross value of direct agricultural production.

Conversion of Farmlands

Historically development patterns in the region have been tied as much to the conversion of agricultural lands as to the consumption of natural lands for urban uses. Rapid growth in the region continues to push development outward in search of cheap land that will translate into more affordable housing. Development pressures can make the value of a farmer's land higher than the value of the crops farmed on the land. A key issue in the region today is whether the high rate of farmland conversion in recent years can be slowed to prevent irreversible losses. An estimated 230,000 acres of farmland and grazing land were converted to non-agricultural uses and/or applied for development entitlements between 1996 and 2004. If this trend continues, the existing inventory of agricultural lands could be reduced by 700,000 acres before 2030.

As agriculture and suburbanization intersect, problems often arise. With so many people living close to so much commercial farming, the negative impacts flow in both

Table 2 Total Agricultural Value by County[a]

County	2005	2006	2002 State Rank[b]
Riverside	1,168,671,100	1,102,438,400	10
Orange	312,336,287	N/A	22
San Bernardino	565,101,000	435,787,200	15
Los Angeles	277,844,000	N/A	21
Ventura	1,225,109,000	1,508,174,000	9
Imperial	1,286,066,000	1,365,368,000	8

[a] Figures are based on total gross value as indicated in county agricultural reports for 2005 and 2006 (when available)
[b] based on total value of agricultural products sold
From the USDA 2002 Census of Agriculture county profiles

directions. For suburban neighbors, there are concerns over dust, noise, odor and even the health effects of living near industrial type activities that use chemicals, heavy machinery and concentrated animal facilities. While for farmers, operating close to new neighborhoods often means reduced productivity and income, regulatory constraints, vandalism and legal liability. Often, the conflict ends in the conversion of still more farmland. Figure 3 highlights those areas where farmlands and urbanization intersect.

Recently studies have looked for ways to integrate farmlands into communities that can reduce or eliminate some of the edge effects described above. New Ruralism is a framework for connecting the concepts of sustainable agriculture and New Urbanism (compact development/ smart growth). It seeks to create permanent agriculture preserves as sources of fresh food for urban regions. These preserves could take the form of green food belt perimeters, buffers between urban areas, small agricultural parks, and/or bigger preserves that include larger farms and rural settlements. The goal is to integrate small to medium scale sustainable agriculture into urban environments, these agricultural preserves can also overlap with areas for wildlife and habitat management and for passive recreation. A major focus of New Ruralism is connecting urban areas to farms through locally grown food.

Eating Locally

The food that Southern Californians eat directly affects local and state policy and in turn, local and state policy affects the food Southern Californians eat. Currently, the federal government spends billions of dollars to subsidize grains and other crops while providing little support for fruits and vegetables. Rising health care costs and increases in diet related diseases such as diabetes and obesity indicate that healthier diets need to be a priority for the region.

Organic food is produced by farmers who emphasize the use of renewable resources and the conservation of soil and water to enhance environmental quality for future generations. Before a product can be labeled "organic," a USDA accredited certifier inspects the farm where the food is grown to make sure the farmer is following all the rules necessary to meet USDA organic standards. Companies that handle or process organic food before it gets to the

Table 3 Organic Farmlands in the SCAG Region - 2005

County	Organic Acres[a]	Total Farmland[b]	Percent Share
Riverside	3,200	466,467	0.7
Orange	143	13,481	1.1
San Bernardino	244	34,673	0.07
Los Angeles	108	44,050	0.3
Ventura	4,712	297,074	1.6
Imperial	N/A	545,611	N/A

[a] Acreage based on annual Agricultural Commissioners Reports for each county

[b] Based on California Department of Conservation 2005 estimates, excludes rangelands/grazing lands

local supermarket or restaurant must be certified and inspected also. Table 3 shows the acres of organic farming in the region. Imperial County does not keep estimates of organic farming.

OPEN SPACE AND HABITAT–AGRICULTURAL LANDS GOALS

- Preserve the productivity and viability of the region's agricultural lands while supporting a sustainable economy and region by:
    - Maintaining a viable level of agriculture to support economic and food supply needs for the region while supporting sustainable energy, air quality and transportation policies;

Promote and support a strong locally-grown food system by encouraging community farming and developing cooperative farming initiates that use sustainable farming practices.

OPEN SPACE AND HABITAT–AGRICULTURAL LANDS OUTCOMES

- Develop a new regional farmland conservation strategy and enroll at least 6,500[12] acres of prime farmland in the first four years.
- No net loss of farmlands enrolled in the regional program through 2035.

Figure 3

OPEN SPACE AND HABITAT–AGRICULTURAL LANDS ACTION PLAN

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Policies															
		x	OSHAL-1 Preserve and promote the productivity and viability of agricultural lands.	x	x	x	x	x	x	x	x	x	x	x	x
x			OSHAL-2 SCAG shall use its IGR process to review projects with potentially significant impacts to important farmlands and recommend impact avoidance and mitigation measures.	x	x	x	x	x	x	x	x	x	x		x
x		x	OSHAL-3 SCAG shall work with its member agencies and the region's farmland interests to develop regional guidelines for buffering farmland from urban encroachment, resolving conflicts that prevent farming on hillsides and other designated areas, and closing loopholes that allow conversion to non-farm uses without a grading permit.	x	x	x	x	x	x	x	x				x
		x	OSHAL-4 Promote the availability of locally grown and organic food in the region.	x	x	x	x	x		x	x		x		x
Local Government Policies															
x			OSHAL-5 Promote the availability of locally grown and organic food in the region. • Local governments should establish transfer of development rights (TDR) programs to direct growth to less	x	x	x	x	x	x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			agriculturally valuable lands (while considering the potential effects at the sites receiving the transfer) and ensure the continued protection of the most agriculturally valuable land within each county through the purchase of the development rights for these lands. • Local governments should consider other tools for the preservation of agricultural lands such as eliminating estates and ranchettes and clustering to retain productive agricultural land. • Local governments should ease restrictions on farmer's markets and encourage cooperative farming initiatives to increase the availability of locally grown food. • Local governments should consider partnering with school districts to develop farm-to-school programs.												
x			OSHAL-6 Local governments are encouraged to obtain assistance from the American Farmland Trust in developing and implementing farmland conservation measures or avoid impacts to important farmlands.	x	x	x	x	x	x	x	x	x	x	x	x
x			OSHAL-7 Local governments should avoid the	x	x	x	x	x	x	x	x	x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			premature conversion of farmlands by promoting infill development and the continuation of agricultural uses until urban development is imminent; if development of agricultural lands is necessary, growth should be directed to those lands on which the continued viability of agricultural production has been compromised by surrounding urban development or the loss of local markets.												
Project Sponsors and Developers															
x			OSHAL-8 Project sponsors shall submit for IGR review projects with potentially significant impacts to important farmlands. Projects should include mitigation measures to reduce impacts and demonstrate project alternatives that avoid or lessen impacts. Mitigation should occur at a 1:1 ratio.	x	x	x	x	x	x	x	x	x	x		x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Initiatives															
		x	OSHALSI-1 SCAG shall work with the agriculture community and other interested parties to establish a regional Farmland Conservation Strategy.	x			x		x	x					x
	x		SCAG shall work with the state to ensure that changes in the Williamson Act will not result in the loss of preserved farmlands.	x			x		x	x					x
	x		SCAG shall work with the state, local farming interests and other interested parties to develop a new alternative statewide farmland conservation strategy that provides flexibility in terms of years in preservation, combined with tiered tax benefits (i.e., the longer the land is in preservation, the greater the tax benefit).	x			x	x	x	x	x				x

[1] To provide a "snapshot" of protected lands SCAG used a database complied by GreenInfo, a nonprofit organization specializing in GIS related services, and the Managed Lands Database complied by the Conservation Biology Institute (CBI), a nonprofit organization specializing in conservation planning.
[2] From 2004 RTP PEIR p. 3.1-17 "In addition to direct impacts on land use, the urban footprint of new development supported by the 2004 RTP is expected to consume 500,000 to 700,000 acres of vacant, undeveloped land by 2030." Direct impacts include 7,700 of grazing land, 1,400 acres of open space, 6,500 acres of prime farmland and 21,300 acres of vacant lands
[3] Core areas are habitat blocks, linkages, or watershed units that protect regional populations of native species, including sensitive, endemic, keystone and umbrella species, and the ecological processes that maintain them.
[4] CDC. Physical Activity and Health: A Report on Recommendations of the Task Force on Community Preventive Services. Retrieved online August 23, 2007 http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5018a1.htm
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[9] CDC. Increasing Physical Activity A Report on Recommendations of the Task Fore on Community Preventive Services. Retrieved online August 23, 2007 http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5018a1.htm
[10] Complete results of the case studies are available in the SCAG's Regional Open Space Program, 2008
[11] For a complete description of LOS and Needs Assessment see SCAG's Regional Open Space Program, 2008
[12] 6,500 acres identified of prime farmland is the number of acres of identified as directly impacted by projects in the 2004 RTP.

Security and Emergency Preparedness

THE CHALLENGE

Southern California is home to significant threats; including earthquakes, wildfires, flooding and mudslides. More recently, terrorism has been added to the threats that the region must prepare against. The complexity of the SCAG region, with a range of potential terrorism targets, presents significant challenges in coordinating and implementing effective homeland security programs. The unexpected and complex nature of these natural and human-caused incidents require extensive coordination, collaboration and flexibility among all of the agencies and organizations involved in planning, mitigation, response and recovery. It should be noted that **safety** is defined as the protection of persons and property from unintentional damage or destruction caused by accidental or natural events. **Security** is defined as the protection of persons or property from intentional damage or destruction caused by vandalism, criminal activity or terrorist attacks. The Transportation Research Board has classified emergency events that affect transportation agencies into several categories, which is illustrated below.

The interdependency of the jurisdictions and organizations makes regional cooperation and coordination essential to security and emergency preparedness. No significant event is truly local, as political boundaries are permeable and critical local infrastructure may serve the entire region. No jurisdiction stands alone. A high-risk, well-resourced municipality may be as dependent on a smaller jurisdiction for support in an emergency as a smaller jurisdiction may be on a larger one. Typically, no single agency is

Emergency Events Impacting Transportation Agencies[1]

Naturally Occurring	Human Caused	
	Intentional	Non-Intentional
Droughts Dust/Wind Storms Earthquakes Electrical Storms Floods High Winds Hurricanes Ice Storms Landslides Naturally Occurring Epidemics Snowstorms and Blizzards Tornadoes Tropical Storms Tsunamis Wildfires	Bomb Threats and Other Threats of Violence Disruption of Supply Sources Fire/Arson Fraud/Embezzlement Labor Disputes/Strikes Misuse of Resources Riot/Civil Disorder Sabotage: External and Internal Actors Security Breaches Terrorist Assaults Using Chemical, Biological, Radiological, or Nuclear Agents Terrorist Assaults Using Explosives, Firearms, or Conventional Weapons Theft Vandalism War Workplace Violence Cyber Attacks	Accidental Contamination or Hazardous Materials Spills Accidental Damage to or Destruction of Physical Plant and Assets Accidents That Affect the Transportation System Gas Outages Human Errors HVAC System Failures or Malfunctions Inappropriate Training on Emergency Procedures Power Outages Software/Hardware Failures or Malfunctions Unavailability of Key Personnel Uninterruptible Power Supply (UPS) Failure or Malfunction Voice and Data Telecommunications Failures or Malfunctions Water Outages

responsible for transportation security. At the local level, especially within transit agencies, safety may be handled within one office. However, it is far less likely that the security of a surface transportation mode is managed by one entity and that this entity is even controlled by the transportation organization. For example, highways and transit networks traverse multiple police jurisdictions, local fire departments generally fill the incident command role after terrorist events, regional command and control centers respond to both natural and intentional disasters, and federal agencies intervene as needed and based on specific guidelines such as the crossing of state boundaries.

A proactive region that improves its homeland security programs and prepares for emergencies is better insulated against the economic, public health, transportation, and other impacts from natural and human-caused accidents. When a disaster occurs, there is a cascading effect on the transportation, utilities, communications, fuel, and water infrastructure services and delivery systems that we depend on. When one of these critical elements in our support system breaks down, it has a domino effect on other elements. When multiple elements break down, the effect can be crippling. Some of the ways in which the infrastructure can be affected in a disaster or emergency and effects on emergency service providers are shown in the tables on the following page.

A continuing, cooperative and collective regional effort will be needed to assist the region in the planning, preparation and response to emergencies, whether caused by natural or human elements. To assist in this effort, this chapter identifies SCAG's potential role and responsibility in regards to the relationship between transportation and emergency preparedness. It describes the current programs at the federal, State and local levels; identifies security issues in the transportation infrastructure; and recommends policies for SCAG and other stakeholders.

The continued emphasis on enhancing transportation security is also reflected in the most recent transportation authorization bill, known as SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users). SAFETEA-LU specifies that Metropolitan Planning Organizations (MPO) such as SCAG shall develop a metropolitan planning process that provides consideration for projects and strategies that will "increase the security of the transportation system for motorized and non-motorized users."

THE PLAN

This chapter of the RCP aims to achieve and sustain risk-based target levels of capability to prevent, protect against, respond to, and recover from major human-caused or natural events in order to minimize the threat and impact to lives, property and the regional economy. This centers around coordinating the numerous plans, programs, organizations and infrastructure in place within the SCAG region to provide safety and security of the regional transportation system for many potential situations.

SCAG's role in homeland security is based on a Georgia Tech model that outlines the potential role of a MPO in relationship to six phases of an incident/disaster:

- Prevention: Stopping an attack before it occurs; improved facility design; surveillance, monitoring
- Response/Mitigation: Reducing impacts of an attack; evacuation; identifying best routes; effective communication system

Possible Effects of Damage to Infrastructure[2]

Service	Effect
Transportation	Inability to get emergency service personnel into the affected area. Inability to transport victims away from the area.
Electrical	Increased risk of fire and electrical shock. Possible disruption to transportation system if downed lines are across roads.
Telephone	Lost contact between victims, service providers, and family members. System overload due to calls from or to friends or relatives.
Water	Disruption of service to homes, businesses, and medical providers. Inadequate water supply for firefighting. Increased risk to public health if there is extensive damage to the water supply or if it becomes contaminated.
Fuel Supplies	Increased risk of fire or explosion from ruptured fuel lines. Risk of asphyxiation from natural gas leaks in confined areas.

Possible Effects of Damage on Emergency Service Providers[2]

Type of Damage	Effect
Roadways, Bridges, Tunnels, Interchanges	Inability to assess damage accurately. Ambulances prevented from reaching victims and/or victims prevented from reaching emergency medical services. Police prevented from reaching areas of civil unrest. Fire departments prevented from getting to fires. Flow of needed supplies is interrupted. Inability to deploy assets as part of incident response and to manage transportation flows Inability for emergency service providers to manage an evacuation
Structural	Damaged hospitals unable to receive patients. Increased risk of damage from falling debris.
Disrupted Communication	Victims unable to call for help. Coordination of services is hampered. Inability for incident command structure to receive real time situational information, reducing its effectiveness
Fuel Line Damage	Fire and paramedic services overburdened. Inability to sustain emergency response and recovery
Disrupted Water Service	Firefighting capabilities restricted. Medical facilities hampered.

- Monitoring: Monitoring and evaluating incidents; surveillance, monitoring, sensing, public information
- Recovery: Facilitating and reconstruction, restoring operation of transportation system
- Investigation: Determination of causes, and responsible parties; security/ police activity
- Institutional Learning: Self-assessment of actions; feedback to prevention element

Because of its traditional role as the MPO for the six-county Southern California region, SCAG is best suited to provide a forum where plans and data can be developed and coordinated with other regional planning efforts; and work towards developing regional consensus, but not be responsible for operation and implementation of plans and programs. SCAG should play a lead role in some areas, a minor role in others, or play no role at all. For example, SCAG has almost no role in the investigation aspect of security, only a minor role; as champion, in the recovery phase; but should play a lead role in championing and convening prevention and developing the institutional learning. SCAG could play a significant role in helping the region coordinate planning in preparation and anticipation

SCAG Role in Security and Emergency Preparedness

Incident Phase	Traditional	Convener	Champion	Developer	Operator
Prevention	●	☑	☑	●	☒
Response/Mitigation	●	☑	☑	●	●
Monitoring/Information	●	☑	☑	●	☒
Recovery	●	☑	●	☒	☒
Investigation	●	☒	☒	☒	☒
Institutional Learning	☑	☑	☑	☑	☑

Not Like Role ☒ Minor Role ● Lead Role ☑

Roles:

Traditional Help manage the system management and operations role in the ongoing transportation planning activities. The primary responsibility for projects rests elsewhere.

Convener The MPO acts as a forum where operations plans can be discussed and coordinated with other plans in the region, still not responsible for operation and implementation.

Champion The MPO works aggressively to develop regional consensus on operations planning. MPO planners develop programs and projects and the MPO takes the lead in developing regional agreements on coordinated operations.

Developer MPO develops regional operation plans and incorporates operations strategies into the transportation plan. System-oriented performance measures would be used to identify strategic operations gaps in the transportation system.

Operator The MPO would be responsible for implementing operations strategies that were developed as part of the MPO-led planning process.

of potential future incidents; and coordinate public information dissemination strategies.

This enhanced leadership and data provision role is designed to support federal, state and local security and emergency responders. The RCP proposes that SCAG coordinate more with these front-line responders to ensure that planning and information are available to help the region deal with inevitable emergencies.

The recommended policies of this plan are also designed to urge transportation planning agencies to devote adequate funding to the operations and maintenance of our aging transportation system. Failing infrastructure is often the result of insufficient roadway, bridge, and transit system maintenance due to lack of funding or other resources. While not as glamorous and earmarking funding for roadway and transit system expansions, our region must improve its commitment to ensuring that the existing transportation system is safe and secure from natural and man-made incidents. To that end, the RCP recommends that SCAG work with partner agencies, federal, state and local jurisdictions to find opportunities to leverage and effectively utilize transportation and public safety/security resources in support of this effort.

Security and Emergency Preparedness Goals

- Ensure transportation safety, security, and reliability for all people and goods in the region.
- Prevent, protect, respond to, and recover from major human-caused or natural events in order to minimize the threat and impact to lives, property, the transportation network and the regional economy.

Security and Emergency Preparedness Outcomes

- Increase per capita funding by 2012 for transportation system maintenance and preservation programs over 2007 levels.
- Increase per capita funding for Intelligent Transportation Systems projects that enhance or benefit regional transportation security.
- 100 percent of government agencies and organizations involved in planning, mitigation, response and recovery involved in improving emergency preparedness coordination, collaboration and flexibility.

SECURITY AND EMERGENCY PREPAREDNESS ACTION PLAN

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Policies															
		x	SEP-1 SCAG shall help ensure the rapid repair of transportation infrastructure in the event of an emergency.		x					x	x		x		
		x	SEP-1.1 SCAG, in cooperation with local and state agencies, shall identify critical infrastructure needs necessary for: a) emergency responders to enter the region, b) evacuation of affected facilities, and c) restoration of utilities.		x		x	x		x	x		x		
		x	SEP-1.2 SCAG, in cooperation with CTCs, California and the federal Government, shall develop a transportation recovery plan for the emergency awarding of contracts to rapidly and efficiently repair damaged infrastructure.		x					x	x				
		x	SEP-2 SCAG shall continue to deploy and promote the use of intelligent transportation system technologies that enhance transportation security.		x			x		x	x		x		
		x	SEP-2.1 SCAG shall work to expand the use of ITS to improve surveillance, monitoring and distress notification systems and to assist in the rapid evacuation of disaster		x						x				

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			areas.												
		x	SEP-2.2 SCAG shall incorporate security into the Regional ITS Architecture.		x						x				
x			SEP-3 SCAG shall establish transportation infrastructure practices that promote and enhance security.		x						x				
x			SEP-3.1 SCAG shall work with transportation operators to plan and coordinate transportation projects, as appropriate, with Department of Homeland Security grant projects, to enhance the regional transit security strategy (RTSS).		x						x				
x			SEP-3.2 SCAG should establish transportation infrastructure practices that identify and prioritize the design, retrofit, hardening, and stabilization of critical transportation infrastructure to prevent failure, to minimize loss of life and property, injuries, and avoid long term economic disruption.		x					x	x				
		x	SEP-3.3 SCAG should establish a Transportation Security Working Group (TSWG) with goals of RTP consistency with RTSS, and to find ways SCAG programs can enhance RTSS.		x					x	x				

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
		x	SEP-4 SCAG shall establish a forum where policy makers can be educated and regional policy can be developed.								x				
		x	SEP-4.1 SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety-security policies.								x				
		x	SEP-5 SCAG will help to enhance the region's ability to deter and respond to acts of terrorism, human-made or natural disasters through regionally cooperative and collaborative strategies.								x				
		x	SEP-5.1 SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety-security policies.								x				
		x	SEP-6 SCAG will help to enhance the region's ability to deter and respond to terrorist incidents, human-made or natural disasters by strengthening relationship and coordination with transportation.		x						x				
		x	SEP-6.1 SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety-security policies.		x						x				

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
		x	SEP-6.2 SCAG shall encourage all SCAG elected officials are educated in NIMS.								x				
		x	SEP-6.3 SCAG shall work with partner agencies, federal, state and local jurisdictions to improve communications and interoperability and to find opportunities to leverage and effectively utilize transportation and public safety/security resources in support of this effort.		x						x				
		x	SEP-7 SCAG will work to enhance emergency preparedness awareness among public agencies and with the public at-large.								x				
		x	SEP-7.1 SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety-security policies.		x						x				
		x	SEP-8 SCAG shall work to improve the effectiveness of regional plans by maximizing the sharing and coordination of resources that would allow for proper response by public agencies.								x				
		x	SEP-8.1 SCAG shall encourage and provide a forum for local jurisdictions to develop mutual aid agreements for essential government services during any incident recovery.								x				

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
		x	SEP-9 SCAG will help to enhance the capabilities of local and regional organizations, including first responders, through provision and sharing of information.								x				
		x	SEP-9.1 SCAG shall work with local agencies to collect regional GeoData in a common format, and provide access to the GeoData for emergency planning, training and response.								x				
		x	SEP-9.2 SCAG shall establish a forum for cooperation and coordination of these plans and programs among the regional partners including first responders and operations agencies.								x				
		x	SEP-9.3 SCAG shall develop and establish a regional information sharing strategy, linking SCAG and its member jurisdictions for ongoing sharing and provision of information pertaining to the region's transportation system and other critical infrastructure.								x				
		x	SEP-10 SCAG shall provide the means for collaboration in planning, communication, and information-sharing before, during, or after a regional emergency.								x				
x			SEP-10.1 SCAG shall develop and incorporate strategies and actions pertaining to response								x				

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			and prevention of security incidents and events as part of the ongoing regional planning activities.												
		x	SEP-10.2 SCAG shall offer a regional repository of GIS data for use by local agencies in emergency planning, and response, in a standardized format.								x				

[1] National Cooperative Highway Research Program Report 525 Volume 9 "Guidelines for Transportation Emergency Training Exercises" McCormick Taylor Inc. 2006

[2] Federal Emergency Management Agency: Community Emergency Response Team (IG-317) Student's Guide

Solid Waste

This RCP chapter is meant to take a close look at some of the challenges in solid waste management that we, as a region, are facing. It will provide a framework for taking the first steps toward a solution. Because this will be an ongoing process, there are some issues – such as hazardous waste, that have not been specifically addressed. However, it is implied that many of the policies described for solid waste management will also apply to management of hazardous wastes.

Note: Much of "The Challenge" section is under discussion with the Solid Waste Task Force. The following represents an interim approach to address the comments received to date but are not necessarily representive of the revisions resulting from the Task Force meeting on October 9.

THE CHALLENGE

A Mountain of Garbage

Between 1990 and 2005, our region disposed of approximately 33 million tons of municipal solid waste (MSW) into local landfills each year. And although we have made great strides in reducing per capita generation, existing landfills will not be enough to accommodate our ever-growing population. Traditional solid waste management strategies have relied heavily on creating high capacity, regional landfills (megafills) and, to a lesser extent in California, incineration technologies to address disposal issues. However, due to health and environmental concerns it has become increasingly difficult to site, open, and operate new disposal facilities.

Dwindling landfill capacity and increasing health and environmental concerns have forced both the region and the state to make concerted efforts at developing other waste management methods including reducing the amount of waste that goes into landfills. As landfill space decreases, the costs for landfilling our garbage will continue to increase, ultimately being passed on to residents and businesses in the form of higher disposal fees and eventually, in conspicuous impacts to public health and the environment.

Wasted Resources

Overflowing landfills are only a symptom of a bigger problem — our mismanagement of natural resources. The result of this mismanagement is evident in the mountains of garbage that we produce and the associated health and environmental impacts. For example, to obtain the resources used in the manufacturing and production of many of the goods that we use everyday, the mining industry moves an estimated 28 billion tons of soil and rocks each year (globally). The goods produced are usually single-use products that we effortlessly replace or throw away. In the meantime, mining leaves behind a wake of destructive impacts. From threatening local and global biological diversity through habitat destruction to increased chemical contamination, erosion, and silting of lakes and streams to toxic air pollution containing arsenic and lead emissions.[1] Natural resource extraction of the degree seen today has already created health and environmental impacts that will last long into future generations. Resource extraction and related activities are also large contributors to greenhouse gas emissions, air quality and water quality problems, and energy consumption.

As a region, we need to acknowledge the inextricable link between natural resource consumption and waste. We need to recognize that our current level of resource consumption and associated waste generation are unsustainable practices.

The Waste Management Challenge

Waste comes from many sources. It is generated by residents, businesses, and industrial enterprises. At our rate of garbage generation, existing landfills are quickly filling to capacity. We will need a combination of both short and long term solutions to effectively address our overwhelming waste problem. In the short term, we will still need to rely heavily on landfills and, when local facilities have filled to capacity, exporting our waste to other areas. In the long term, we will need to change the way we think about trash and move towards a Zero Waste system. Achieving Zero Waste will take time and until then, we will need to employ all waste management strategies.

THE PLAN

Strategies for Waste Management

Landfills today are technically sophisticated, highly regulated, and closely monitored by many local and state agencies. Methane and leachate collection systems are installed in many facilities and state-of-the-art leachate[2] barriers (landfill liners) are required under current regulations. However, even our current level of technology is not 100% effective in preventing fugitive emissions and, as with anything man-made, landfill liner and collection systems are still prone to failure. Landfill emissions are a major source of greenhouse gases, can aggravate air quality problems, and pose a threat to groundwater aquifers. According to the EPA, "the more reasonable assumption, based on known pressures placed on liners over time, is that any landfill liner will begin to leak eventually (Lee, 2007)."

Concerns have also been raised about the health and safety hazards that landfills pose. These hazards can range from landfill emissions, pests (insects, rodents, vermin), and unpleasant and possibly toxic odors to dust from truck and waste dumping activities, noise from landfill operations, and increased truck traffic. However, many landfills employ extensive environmental control systems to minimize any threats to public health and safety.

Landfills fill a need today and will continue to be needed well into the future. Even as we employ all waste prevention, recycling, reuse, composting, conversion technology, and other waste management strategies, there

SIDE BAR : Air quality, GHG emissions, and Water – MAY BE DELETED (depending on solid waste task force)

Landfill emissions are mainly composed of (1) gases, such as methane, carbon dioxide, and a small fraction of volatile organic compounds (VOCs) and (2) toxic leachate (garbage juice). The typical composition of landfill gas is 45-60% methane, 40-60% CO_2, 2-5% N_2, and a small percentage of a variety of other gases, including hydrogen sulfide and carcinogenic VOCs such as benzene, toluene, xylene, and vinyl chloride (ASTDR, 2001). Many VOCs also react with nitrogen oxides (NOx) in the air to create ground-level ozone and smog. Landfilling activities and truck traffic throw dust and particulate matter into the air.

Landfills are a major contributor of greenhouse gases. Worldwide, landfills account for 25% of human-made methane emissions. Methane is a more potent greenhouse gas than carbon dioxide; it has approximately 21 times the global warming potential than CO_2 (EPA, 2007).

Landfill leachate also poses a potential threat to groundwater aquifers. Once leachate contaminates an aquifer, it is very difficult to cleanse the aquifer of the pollution. The aquifer can no longer be considered reliable for human consumption (Lee, 1994). Since landfill liners will eventually leak, future generations may have to deal with Superfund-type[3] groundwater remediation from landfill leachate pollution in groundwater.

will always be some inefficiencies in the system and therefore, waste, that will need to be disposed to a landfill. The challenge will be to change our ideas of resource consumption and waste and realize that disposal to landfills should be a last resort. Many of today's health and environmental concerns will become less of a problem as we reduce our garbage volume and become more selective about what we dump.

~~One of the most tangible effects of landfills is the number of health complaints caused by odors. Many people living near landfills complain of, nausea, headaches, increased respiratory symptoms, sleeplessness, and psychological[4] problems (ASTDR, 2001). Researchers have attempted to link landfill odors and gas emissions with increased risks of birth defects and cancer, but studies have so far proved inconclusive.~~

~~Water quality hazard~~

~~The affect of MSW leachate on public health is not well-studied. A review of studies on the relationship of health and landfill proximity has shown little correlation with epidemiological patterns. However, there are well over 65,000 chemicals in US commerce with 1,000 new chemicals being added each year and only about 200 are regulated and measured in studies of landfill leachate contamination (Lee, 1994). Currently, there are approximately 75,000 toxic chemicals in the EPA's TSCA inventory (EPA, 2006).~~

Exporting Trash

Shrinking landfill capacity and public opposition to siting disposal facilities in urban areas is forcing us to transport waste to more distant landfills. A prime example of this is the planned Waste-By-Rail system for Los Angeles County. The system is designed to address the projected shortfall of disposal capacity in Los Angeles County by transporting post-recycled waste to an out-of-county landfill. The rail system will have multiple starting points at large-scale materials recovery facilities throughout Los Angeles County. At these sites waste will be loaded into shipping containers ("intermodal containers") and delivered to the rail loading station (the "intermodal facility") by truck. The rail system will use existing rail lines to transport the waste to Mesquite Regional Landfill, located in Imperial County approximately 35 miles east of Brawley. The landfill is nearing the final stages of construction and is expected to be operational by 2009. Upon completion, the facility will cover 2,290 acres. It is permitted to accept up to 20,000 tons of waste per day from L.A. County and 1,000 tons per day from Imperial, with a maximum capacity of 600 million tons of solid waste over a 100 year lifespan. The development of this waste-by-rail system is a direct result of the collaborative effort of local and county public officials that have provided extensive input into the system. Although exporting waste is not a preferred waste management option, it is a necessary strategy for ensuring the County has a place to dispose of the garbage generated by County residents and businesses.

Unlike other states, California does a good job of keeping waste within its borders. Only 1% of waste generated in California is exported out of state. In the SCAG region, less than 1% of our waste is exported outside of the region.

Diverting Garbage Away from Landfills

In 1989, the legislature passed the California Integrated Waste Management Act (AB 939). This bill mandated a 50% solid waste diversion[5] rate by the year 2000 for all waste management jurisdictions in California. Since then, Californians have done a great job in reducing the amount of waste sent to landfills. Although not all individual

jurisdictions have managed to achieve the 50% diversion rate, all jurisdictions are making good-faith efforts to comply with the mandate. Statewide the estimated diversion rate for 2006 is 54%. This diversion rate translates to 50.1 million metric tons of waste (out of 92.2 million metric tons of waste generated) that avoided disposal to landfills (CIWMB, 2007).

[GRAPHIC: Material classes from CA's overall waste stream, 2003]

The Waste Stream

In California, the waste stream is composed primarily of, by volume, organic (food) waste, paper products, and construction and demolition debris. But harder-to-

SIDE BAR: Economic Benefits of Diversion

Diversion activities create jobs, add revenue, and help stimulate many economic sectors. Some employment opportunities created by these activities include government and private staffed collectors, recyclable material wholesalers, compost and miscellaneous organics producers, materials recovery facilities, glass container manufacturing plants, plastics converters, and retail used merchandise sales. A 2001 report released by UC Berkeley stated that, "diverting solid waste has a significantly higher (positive) impact on the economy than disposing it." Diversion also helps communities save money by avoiding payment of tipping fees[6] on each ton of waste disposed. The UC Berkeley study estimated that statewide economic impacts from disposal and diversion at 1999 rates were approximately 17 to 20 percent higher than the impacts if all the waste had been disposed (Goldman and Ogishi, 2001). This is because reuse and recycling are inherently value-adding, whereas disposal is not; and value-adding processes support jobs and economic activity (REI, 2001).

Table X.X. Economic Impacts of 1999 Waste Generation Going to Disposal or Disposal and Diversion

Region		Estimated Final Sales 1999 (billions of dollars)	Impact on Economy			
			Output[b] (billions of dollars)	Total Income[c] (billions of dollars)	Value Added[d] (billions of dollars)	Number of jobs created
All California	Disposal only	7.5	18.0	6.8	9.0	154, 000
	Disposal and Diversion	9.2	21.2	7.9	10.7	179,000
Southern California[a]	Disposal only	4.1	9.6	3.6	4.7	82,000
	Disposal and Diversion	5.1	11.3	4.2	5.6	95,000

Table adapted from Goldman, G. and A. Ogishi, 2001. The Economic Impact of Waste Disposal and Diversion in California. A Report to the California Integrated Waste Management Board.

[a] Southern California region includes all six SCAG region counties plus San Diego County.

[b] Output impact is a measure of how the disposal sectors influence total sector sales in the economy.

[c] Income impact measures income attributed to disposal-related economic sectors.

[d] Value added is the increase in the value of goods and services sold by all sectors of the economy.

decompose items such as plastic, glass, metal, electronic, and hazardous wastes are also present in the waste stream in significant amounts. (see Figure X.X).

Reuse and Recycling

California hosts approximately 5300 recycling and reuse establishments, employing 84,000 people and generating an annual payroll of $2.2 billion with $14.2 billion in annual revenues (NRC, 2001). However, California's recycling market is still on shaky ground, especially because of competition from foreign recycling markets. Many countries will pay a premium for our recyclables because they lack their own natural resources. In an effort to support recycling the local recycling industry, the Integrated Waste Management Board has developed the Recycling Market Development Zone (RMDZ) program. The program provides loans, technical assistance, and free product marketing to businesses that use materials from the waste stream to manufacture their products.

There are numerous benefits to recycling and reuse programs. Reuse and recycling reduce the need for landfilling and prevent pollution caused by the manufacturing of products from virgin materials. They help conserve natural resources (timber, water, minerals); sustain the environment for future generations; save energy and avoid fossil fuel use from extractive industries; decrease emission of GHGs that contribute to global climate change, protects; and expand U.S. manufacturing jobs and increases U.S. competitiveness (EPA, 1998). A 1994 Tellus Institute study showed that with the exception of aggregate materials for road base, many materials show energy savings by using recycled instead of virgin materials. The range of differences in energy saved varies greatly. At the high end is aluminum for which the difference in virgin versus secondary production is 142.68 MMBtu per ton of intermediate product (i.e., it takes 142.68 MMBtu per ton more to process aluminum from raw ore than it does to process the same product from recyclables). At the low end is molten glass for which the energy difference is only 1.54 MMBtu per ton of product. A more recent study from ALCOA has shown that it takes 95% less energy to recycle aluminum than to create it from raw materials.

GRAPHIC: Simplified Life cycle of products (recycled and raw materials)

GRAPHIC: R,R,R Waste Heirarchy

Construction and Demolition (C&D) Debris

Construction and demolition debris comprises 21.7% of California's overall disposed waste stream. This equates to approximately 8.7 million tons of C&D debris disposed to landfill. Lumber debris makes up half of that figure, followed by concrete, asphalt roofing, gypsum board, and composite/remainder C&D. These estimates come from the CIWMB Waste Characterization Study conducted in 2004.

Addressing C&D waste prevention can be as simple as using best practices during construction such as advanced

framing, double checking measurements to reduce sizing mistakes, and using durable materials that need less frequent replacement (Alameda County, 2006). It also means using green building design principles to maximize the use of remanufactured, recycled, or more efficient materials or materials that are designed to be replaced in a modular manner. Unlike demolition waste, up to 80% of construction waste is reusable or recyclable. (City of SM)

Cities are starting to institute green building ordinances that require maximum recycling of C&D debris for many types of new construction. There are no statewide requirements for green building or C&D recycling ordinances. Currently, each city can develop its own requirements; defining the size, cost, and type of project that is subject to C&D recycling as well as, the amount of material recycling required can differ a great deal from city to city. This poses a difficulty for construction companies that do business in many cities.

Food Waste, Organics, and Composting

Californians throw away more than 5 million tons of food scraps each year. Food waste makes up 14% of California's waste stream. This includes all food being disposed by residences, businesses, schools, prisons, and other institutions. Green material collection programs have been implemented in many cities and counties, but not until recently has collection of food scraps been considered. Management of food scraps provides additional opportunities to help meet the State's diversion goals as well as provide greater uses for this resource. The CIWMB suggests the following order for food scrap management: (1) prevent food waste, (2) feed people, (3) convert to animal feed and/or rendering, and (4) compost. Large events and venues, public facilities (e.g., public agency and school cafeterias), and private business such as restaurants and grocery stores could all be targeted for food waste diversion activities.

Decomposition of food waste and other organics are a major source of greenhouse gas emissions from landfills. Organic waste comprises 30% of waste disposed to landfills. That figure includes food scraps, textiles, composite organics, and green material like landscape and tree trimmings, grass clippings, and agricultural residues. Diverting organic wastes to composting prevents the production of methane, which is produced during decomposition under anaerobic (oxygen-lacking) conditions. Although composting has its own set of environmental concerns, primarily odor complaints, advancements in composting technologies are able to overcome these problems. Composting has many environmental benefits. In addition to reducing landfill volume and emissions by diverting organic waste, compost can be used to enhance garden and agricultural soils, as landfill cover, in wetland construction, for erosion control, and in land/stream reclamation projects.

Conversion Technologies

Conversion technologies (CTs) refer to a diverse set of processes used to convert waste products into high-value goods such as industrial chemicals or gas, liquid, and solid fuels. Fuel products can be burned to produce energy or refined for higher quality uses to make a variety of industrial products. The attraction of CTs is their ability to convert landfill waste into products that can take the place of fossil fuels mined from natural resources.

CTs target *post-recycled* municipal solid waste residuals currently destined for disposal as their feedstock. That is, before waste is sent to a CT facility, it is sorted to make certain recyclables are removed and collected. Many CT proponents feel CTs with recycling offer a much better

alternative than incineration or disposal to landfill.

A study conducted for CIWMB compared a life cycle analysis of landfills (with various stages of landfill gas collection), waste to energy (WTE) combustion (incineration), and hypothetical conversion technologies. It was found that the hypothetical CT scenario could potentially have a two times lower net energy consumption when compared to the incineration scenario and up to 11 times lower than landfill without energy recovery. The CT scenario included energy savings (10-20% of the total net energy savings) from additional materials recycling prior to conversion and the offsets associated with the prevention of extraction and production of virgin materials (CIWMB, 2005). However, the environmental benefits of conversion technology scenarios are highly dependent on their ability to achieve high conversion efficiencies and high materials recycling rates.

The best feedstock for CTs are carbon-rich items such as sewage sludge, plastics, tires, agricultural waste, wood, and other paper products. This raises concerns that CTs could potentially discourage recycling. It is therefore important that issues such as these be addressed to properly integrate a CT facility into the zero waste strategy. All conversion technologies will produce a small amount of solid residue that will need to be disposed in landfills. The public health impacts of conversion technologies are still being assessed, but CTs with appropriate controls and emissions technology produce lower emissions of criteria air pollutants (NO_x and SO_x) and CO_2 than landfills (CIWMB, 2005).

At the current time, conversion technologies are considered ineligible as a diversion strategy and the permitting and siting of CT facilities has been met with opposition partly due to the concerns mentioned above. In the eye of the Integrated Waste Management Board, there is a high level of uncertainty regarding the environmental performance of CTs. Conversion technologies have been around for decades, but it is only recently that their applicability to solid waste management has begun to be fully developed. However, the successful development and use of CTs is already occurring in Japan, Germany, and the UK. It should be noted that conversion technologies are not the definitive answer to the overflowing waste problem. Rather, like waste-to rail initiatives, they are only a part of the solution as we move forward toward a Zero Waste system.

Two main types of conversion technologies are being developed for management of solid waste – thermochemical conversion and biochemical conversion.

- Thermochemical conversion is characterized by processes that use high temperatures to achieve high conversion rates of dry, organic material. These processes include gasification, pyrolysis, plasma arc, and catalytic cracking. *Advanced thermal conversion (advanced thermal recycling) primarily refer to technologies that employ only pyrolysis and/or gasification to process municipal solid waste [Defra, 2005]*. The primary products of thermochemical conversion technologies include: fuel gas (syngas - CO_2, CO, CH_4, H_2), heat, liquid fuel, char, and ash.
- Biochemical conversion processes use lower temperatures than thermochemical conversion and have lower reaction rates. These processes are focused on the conversion of biodegradable organics found in MSW residue into high energy products. The products of bioconversion are biogas (CH_4 and CO_2), biofuel (ethanol, biodiesel, fuel oil, etc.), and residue that can be used for compost. Biogas usually has less energy

(Btu/ft^3) than syngas produced by thermal conversion systems (URS). Non-biodegradable organic feedstocks, such as most plastics, are not convertible by biochemical processes.

The Zero Waste Strategy

In the last 10-15 years there has been a strong movement to recognize the inextricable link between the waste we generate and our consumption of natural resources. Today's economy is based on the extraction of "cheap" resources to make products that are largely designed to end up in landfills. Waste is a reflection of our inefficient use and mismanaged consumption of finite, natural resources. The Zero Waste movement is an attempt to redefine the waste paradigm and bridge the gap between waste and consumption.

~~"At the heart of the concept of sustainability is a fundamental, immutable value set that is best stated as 'parallel care and respect for the ecosystem and for the people within'. From this value set emerges the goal of sustainability: to achieve human and ecosystem well-being together. It follows that the 'result' against which the success of any project or design should be judged is the achievement of, or the contribution to, human and ecosystem well-being together. Seen in this way, the concept of sustainability is much more than environmental protection in another guise. It is a positive concept that has as much to do with achieving well-being for people and ecosystems as it has to do with reducing stress or impacts." (Tisdell, 1988)~~ MOVE TO SUSTAINABILITY DISCUSSION – Chap 1

The Zero Waste paradigm builds on all the waste diversion strategies that were previously discussed. The three Rs of waste management – Reduce, Reuse, Recycle – still hold true, but with the emphasis placed on the first R. It goes beyond current waste diversion strategies by addressing waste elimination at the source and distributing the responsibility for waste on both the consumer and the producer. Instead of managing just the end results of our consumption-related activities (trash), we focus on resource conservation and management. The aim is to create a whole system approach to the way materials flow through society, where all discarded materials are resources for others to use and resource conservation and recovery is built into every process. Zero Waste means designing and managing products and processes to reduce impacts to the environment, volume and toxicity of waste and materials, and waste of natural resources, as well as managing materials flow to prevent the creation of un-recyclable products. We can probably never achieve 100% materials efficiency but, "we can get darn close!"[7]

© Eco-Cycle 2005. Contact Eco-Cycle to use graphics and/or text. [GRAPHIC: Zero Waste Materials Flow – example above]

SIDE BAR: Life Cycle Assessments (Analyses)

Life Cycle Assessments (LCAs) need not be limited to analyzing the life cycle of a single product. LCA is a methodology that can analyze the interactions of a technological system with the environment. It can be used as a decision-making tool to help weigh environmental and health impacts between various waste management options. If used correctly,[9] LCAs can answer questions like, "Are impacts from manufacturing aluminum cans from raw material really much worse than the impacts from re-manufacturing of recycled aluminum and if so, how much worse?" and "Have the costs of environmental and health impacts, such as losing ecosystem services[10] and the loss of worker days been calculated into the costs?" Governments, private firms, consumer organizations, and environmental groups can all use LCA as a decision support tool (Tan and Culaba, 2002).

SIDEBAR: List of Zero Waste communities

Many communities in (and out) of the SCAG region are already aiming for Zero Waste!

- City of Los Angeles: 70% diversion by 2020; 90% by 2025 (RENEW LA Plan; Zero Waste Plan)
- City of Santa Monica: 70% diversion by 2010; (In Sustainable City Plan)
- City of Oakland: 75% diversion by 2010; Zero Waste by 2020.
- City of Pasadena: Zero Waste by 2040 (In Green City Action Plan).
- Culver City (In Sustainable Community Plan)
- State of California, Integrated Waste Management Board (Zero Waste California)
- Rancho Cucamonga
- San Bernardino Zero Waste Communities
- San Francisco City and County
- Berkeley: 75% 2010; Zero Waste 2020.
- New Zealand adopted ZW as a goal

Zero Waste promotes strategies that look at the entire product life cycle to assess the true economic, environmental, and health-related costs of manufacturing a product. Life cycle assessments[8] (LCAs) attempt to appraise all the inputs and outputs that are associated with the creation and disposal of a product. Included are the direct inputs to the production process, associated wastes and emissions, and the future (downstream) fate of the product.

Through LCAs and similar applications, a sustainable, economic market can be created by developing more efficient systems that minimize the need for virgin materials and maximize the use of materials already available. By evaluating the existing materials flowing through a community, we can identify opportunities to take what one business considers a byproduct or waste and provide that material to another business that can use it as a production feedstock or input. This is good policy for the region as existing businesses can save money by creating efficiencies in production (CCRED, n.d.).

The 2004 Growth Vision recognized this and stated that "management of solid waste (and hazardous waste) must be sustainable in order to efficiently manage natural resources and in order to protect the environment today and in the future."

Product Stewardship and Extended Producer Responsibility

Zero Waste requires that we change the current waste management hierarchy to one that focuses on product stewardship and extended producer responsibility principles because one of the most effective ways to manage waste is to prevent it from being produced in the first place.

Product stewardship is a product-centered approach to environmental protection. It extends the responsibility for a product to everyone involved in the product lifecycle (EPA, 2007b). This means that manufacturers and producers design products that are recyclable, reusable, less toxic, less wasteful, and/or more durable. Retailers and consumers are then responsible for ensuring that proper recycling and disposal of products occur.

Product stewardship is often used interchangeably with Extended Producer Responsibility (EPR). However, EPR focuses the brunt of the responsibility for creating an environmentally compatible product on the manufacturers and producers of the product. Producers retain responsibility for their end-of-life (EOL) products, which should induce them to address the problems of reengineering and designing for dismantling, reuse, and recycling. For example, businesses making products that are leased, such as HP (photocopiers) have long known that their products will be returned so they have learned to make remanufacturing profitable [Clift and france, 2006]. When businesses are compelled to internalize the true costs of wasteful packaging and inefficient material use, there is incentive to create more efficient waste management strategies.

EPR policies should give producers an incentive to design products that:

- use fewer natural resources;
- use greater amounts of recyclate in the manufacture of the product;
- can be reused;
- can be more easily treated/dismantled and recycled;
- reduce or eliminate the use of hazardous substances or materials in the manufacture of a product.

The long-term purpose of EPR is to encourage more environmentally friendly product development—products that require fewer resources, are easier to reuse/recycle, and which contain fewer environmentally dangerous substances (Strenström and Ritchey, 2004). The concept promotes a more sustainable approach to resource use and a reduction in the quantity of waste going to a landfill, by diverting end of life products to re-use, recycling, or other forms of recovery. Many corporations are recognizing the value of EPR and have developed voluntary EPR strategies in their organizations.

Voluntary examples of EPR in U.S.

Xerox's Asset Recycling Management Program – a model EPR program which has led to extensive product redesign. The program has generated substantial profits by maximizing recovery of the residual value of office equipment, which the company takes back at the end of its useful life.

Kodak's take-back and recycling program for single-use cameras has had marketing benefits in helping to dispel these products' image as throwaway items that quickly end up in the landfill.

Interface, a global carpet company, has a program to lease carpet and recycle it at the end of its life. DuPont, 3M, Milliken and Collins & Aikman are also taking back and recycling carpeting.

The Solid Waste Action Plan

All of the strategies that have been laid out are meant to provide guidance and background for implementing the action plan that follows. The goal attempts to encapsulate the vision for solid waste and resource management that will move our region toward a more sustainable and healthier future. This will require a coordinated effort of implementing all of the short-term and long-term policies/actions that are contained within this plan. Some,

of which require changing how our whole region thinks about solid waste management issues.

We will need to employ a mix of waste management strategies as we move towards a Zero Waste region. Recycling, composting, conversion technologies, and landfills all play a part in moving towards a Zero Waste region. We will need to employ this mix of strategies to handle current waste disposal needs as we transition to a system of real natural resource management. Even if we achieve close to 100% materials efficiency, there will still be residual waste that will need to be landfilled or managed with conversion technologies.

Solid Waste Goals

- A Zero Waste[11] region that conserves our natural resources, reduces our reliance on landfills, and creates new economic opportunities in the most environmentally responsible manner possible.

Solid Waste Outcomes

- All SCAG region jurisdictions should meet a 30% waste disposal rate by 2035 to minimize disposal to landfill providing appropriate employment of technologies are permitted and diversion credit is provided by the State for waste management strategies including, but not limited to, appropriate and environmentally sound recycling, composting, and conversion technology facilities as well as other actions and strategies contained in this chapter, such as product stewardship and extended producer responsibility.
- Conversion technologies should be available as a diversion strategy in the next five years with one or more new conversion technology facilities sited in the SCAG region by 2020.

SOLID WASTE ACTION PLAN

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Policies															
	x		SW-1 SCAG shall encourage all levels of government to advocate for source reduction and waste prevention.	x	x	x	x	x	x	x		x	x	x	x
x			SW-2 SCAG shall encourage policies that: (a) promote the expansion of recycling programs and facilities that provide local recycling services to the public and private sectors; and (b) encourage the development of viable, local, and sustainable markets to divert materials from landfills (e.g., recycling markets).	x	x	x	x	x	x	x		x	x	x	x
		x	SW-3 SCAG shall adopt and implement "green" procurement policies and participate in programs that promote the purchase of recycled content products		x	x	x	x	x	x		x	x		x
	x		SW-4 SCAG shall support and encourage the CIWMB to conduct comprehensive life cycle assessments of **all** components of the waste management practices including but not limited to, waste disposal to landfills, composting, recycling, and conversion technologies. A comprehensive analysis must include environmental impacts, health effects, emissions, use of resources and personnel,		x	x	x	x	x			x	?	?	?

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			costs of same to collect wastes and recyclables, transportation costs (local, within U.S. or international), process to separate recyclables, and production of end products using collected recycled materials.												
	x		SW-5 SCAG shall continue to support and encourage legislation that advocate for the elimination of unnecessary duplication and/or restrictive regulations that hinder recycling, reuse, composting and conversion of solid waste and redefines conversion technologies as a diversion strategy to allow development of these facilities in the SCAG region.	x	x	x	x	x	x	x		x	x	x	x
		x	SW-6 SCAG should coordinate region-wide initiatives on source reduction, reuse, recycling, composting, and conversion technology to increase economies of scale.	x	x	x	x	x	x	x		x	x	x	x
x			SW-7 SCAG should encourage the equal distribution of industrial impacts among all income levels from all types of solid waste management facilities including recycling, composting, and conversion technology facilities.	x	x	x	x	x	x	x		x	x	x	x
		x	SW-8 SCAG shall support the development of public education and outreach efforts to increase awareness of the benefits of a	x	x	x	x	x	x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			regional zero waste policy.												
Local Government Policies															
x			SW-9 Local governments should update general plans to reflect solid waste sustainability issues such as waste reduction goals and programs (1996 RCP; 135).	x	x	x	x	x	x	x		x	x	x	x
x			SW-10 Local governments should discourage the siting of new landfills unless all other waste reduction and prevention actions have been fully explored. If landfill siting or expansion is necessary, landfills should be sited with an adequate landfill-owned, undeveloped land buffer to dilute the adverse impacts of the landfill in neighboring communities.	x	x	x	x	x	x	x		x	x	x	x
x			SW-11 Local governments should discourage exporting of locally generated waste outside of the SCAG region. Disposal within the county where the waste originates shall be encouraged as much as possible. Green technologies for long-distance transport of waste (e.g., clean engines and clean locomotives or electric rail for waste-by-rail disposal systems) should be given primary consideration.	x	x	x	x	x	x	x		x	x	x	x
		x	SW-12 Local governments should adopt Zero Waste goals and practices and look for	x	x	x	x	x	x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			opportunities for voluntary actions to exceed the 50% waste diversion target.												
		x	SW-13 Build local markets for waste prevention, reduction, and recycling practices.	x	x	x	x	x	x	x		x	x	x	x
	x		SW-14 Local governments should adopt and implement green building ordinances that: (a) help divert construction and demolition debris from landfills and (b) encourage the use/reuse of recycled/reusable materials in construction projects. *The ordinance should require the inclusion of a waste management plan that promotes maximum reuse and recycling of construction and demolition debris in construction contracts.*	x	x	x	x	x	x	x		x	x	x	x
	x		SW-15 Local governments should develop ordinances that promote waste prevention and recycling such as: requiring waste prevention and recycling efforts at all large events and venues; implementing recycled content procurement programs; and instituting ordinances to divert food waste away from landfills and toward food banks and composting facilities.		x	x	x	x	x	x		x	x	x	x
x			SW-16 Support environmentally friendly alternative waste management strategies such as composting and conversion technologies.	x	x	x	x	x	x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
x			SW-17 Developers and local governments should develop and site composting, recycling, and conversion technology facilities that are environmentally friendly and have minimum environmental and health impacts.	x	x	x	x	x	x			x	x	x	x
		x	SW-18 Coordinate regional approaches and strategic siting of waste management facilities.	x	x	x	x	x	x			x	x	x	x
x			SW-19 State and local governments should facilitate the creation of synergistic linkages between community businesses and the development of eco-industrial parks and materials exchange centers where one entity's waste stream becomes another entity's raw material by making priority funding available for projects that involve co-location of facilities.	x	x	x	x	x	x			x	x	x	x
x			SW-20 Developers and local governments should prioritize siting of new waste management facilities including recycling, composting, and conversion technology facilities in conjunction with existing waste management or material recovery facilities.	x	x	x	x	x	x			x	x	x	x
x			SW-21 Local governments should increase programs to educate the public and increase awareness of reuse, recycling, and composting benefits and raise consumer education issues		x	x	x	x	x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			at the County and City level, as well as at local school districts and education facilities.												
State and Federal Government Policies															
	x		SW-22 CIWMB should increase waste diversion incentives to promote waste diversion past the current 50% diversion mandate of AB939.	x	x	x	x	x	x	x		x	x	x	x
	x		SW-23 The State and Federal governments should develop and implement new and existing legislation that requires recycled content procurement programs, favoring the purchase of recycled and recyclable products or products with built-in EPR design in all state and federal agencies.		x	x	x	x	x	x		x	x	x	x
	x		SW-24 Federal and State governments should explore financial incentives such as tax credits, subsidies, and price supports for waste diversion activities that include waste reduction, recycling, composting, and conversion technologies.		x	x	x	x	x	x		x	x	x	x
		x	SW-25 CIWMB, Air Resources Board, and the California Water Resources Board should coordinate to address regulatory challenges and streamline the permitting process for solid waste conversion and composting technologies.	x	x	?	?	?	?			x			x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
	x		SW-26 The Federal government and CIWMB should establish policies that provide (a) diversion credit for beneficial use of *post-recycled*, solid waste residuals managed at non-burn conversion technology facilities, and (b) separate and remove conversion technologies from the definition of "transformation."			?	?	?	?			x	x	x	x
	x		SW-27 Federal, State, and local governments should support and encourage federal and state incentives for the research and development of pilot or demonstration projects for solid waste conversion technologies.			?	?	?	?			x			x
		x	SW-28 CIWMB should do the following to improve education and awareness of solid waste management issues: (1) actively promote education regarding reuse, recycling, composting and solid waste conversion technology programs; (2) provide information concerning the costs and benefits of these programs to local governments; and (3) facilitate state and local government coordination of consumer awareness programs to minimize unnecessary duplication of effort in solid waste outreach programs carried out by local government.		x	x	x	x	x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
	x		SW-29 The Federal government should provide funding and support for continuation of public education programs on waste management issues.		x	x	x	x	x	x		x	x	x	x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
State and Federal Government Initiatives															
	x		SWSI-1 Federal, State and local governments should support and implement source reduction policies which promote product stewardship through the following actions: • Support and encourage Federal and State legislation that create incentives for participation in Extended Producer Responsibility such as, encouraging public-private partnerships with product stewardship goals (e.g. The European Green Dot system) and offering incentives to producers who use recycled content to encourage growth in the recycled contents market. • Create ordinances with extended producer responsibility (EPR) policies that require producers and manufacturers to produce "sustainable" packaging and products, develop life cycle assessments for products, as well as, support the development of infrastructure and markets for the recycling and reuse of these products. EPR principles that should be included are: increasing the useful life of products through durability and		x	x	x	x	x	x		x	x		x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			reparability; increasing production efficiency to produce less production waste and less packaging waste; increasing recyclable material content and reducing virgin material content; facilitating material or product reuse; and decreasing of the toxicity of products. Packaging should be easily recyclable or biodegradable based on any number of EPR strategies including, Design for the Environment (DfE) or Design for Disassembly (DfD) principles. For example, businesses such as, takeout food distributors, should utilize packaging that is compatible with recycling and composting options available. • Create ordinances that ban items from landfill disposal (e.g., construction and demolition material) or ban the use of materials that cannot be recycled to prevent the material from entering the waste stream (e.g., styrofoam and other unrecyclable, plastic fast-food packaging).											
	x		SWSI-2 Federal and State and local governments should institute "eco-taxes" and EPR initiatives that require companies to		x	x	x	x	x	x		x	x		x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			internalize environmental damage costs associated with their products and help companies derive profit from resource efficiency. These would include the following actions: • Institute Pay As You Throw (PAYT) trash disposal systems. • Identify and alter tax policies that enhance polluting industries and products at the expense of more environmentally benign systems and goods such as, shifting taxes from income and labor ("goods") to resource depletion, wasting, and polluting activities ("bads") and ending government subsidies that promote virgin materials extraction, processing, and manufacturing activities. • Add a packaging tax with rates based on the environmental impacts of different packaging materials (based on Danish system); require that companies take back certain types of packaging for reuse or recycling; or add a levy, quota, or ban on one-way beverage containers or require the use of refillable beverage containers only.												

[1] Fishbein et al., 2001
[2] Leachate is a concentrated chemical soup produced as water percolates through decomposing garbage in a landfill. Toxic chemicals are produced or leached from the decomposition of both toxic and non-toxic trash.
[3] Superfund is the name given to the environmental program established to address abandoned hazardous waste sites (EPA, 2007 http://www.epa.gov/superfund/about.htm).
[4] The added disruption of constant exposure to odors can increase stress and impact a residents' day to day quality of life (ASTDR, 2001).
[5] Diversion is generally defined as the reduction or elimination of the amount of solid waste from solid waste disposal (to landfill or incineration). Source reduction (waste prevention), recycling, reuse, and composting activities are considered diversion.
[6] The fee charged for unloading solid waste at a landfill or transfer station. http://www.ciwmb.ca.gov/LGCentral/Glossary.htm#sz
[7] Zero Waste New Zealand Trust, 2003; Zero Waste International Alliance, 2007
[8] Also referred to as Life Cycle Analysis
[9] The Society for Environmental Toxicology and Chemistry (SETAC) has defined guidelines for the stages of a generic product life cycle that must be considered in LCAs. (Tan and Culaba, 2002).
[10] Ecosystem Services are the processes necessary to sustain and fulfill human life by which the environment produces resources that we often take for granted such as clean water, timber, habitat for fisheries, and pollination of native and agricultural plants. Many of these services are seemingly "free", yet are worth trillions of dollars (ESA,n.d.)
[11] Zero Waste does not assume that 100% of waste is ultimately diverted from landfills. Rather, it is a whole system approach that aims to completely change the way materials flow through society with a goal of no waste being generated.

Transportation

The continuing urbanization of our Southern California region is making it more difficult to make meaningful improvements to our transportation system. Rebuilding and expanding an existing transportation facility in a built out urban environment is expensive and often unpopular. When transit projects, new roads, or other travel options are unveiled, we see temporary improvements. However, those usually disappear within months, replaced by a return to traffic and congestion, which generally seem to get worse as the years go by. In 2006, the State of the Region report card gave a failing grade of "F" to Southern California, noting that we continue to rank as the most congested metropolitan region in the nation. While recent higher gas prices have helped reduce congestion growth, the region still shows a continuing trend towards reduced carpooling and transit ridership.

Our transportation challenge is shared by other metropolitan regions throughout the world. Traffic congestion is largely a symptom of the growth patterns and population density of our region. The decentralization of our region's growth, combined with the sheer density of people, jobs, and cars makes it nearly impossible for our transportation system to keep pace. Indeed, a successful transportation plan in any growing region of the country is one that holds the line on traffic congestion. Most plans simply make future traffic "less worse" than if nothing were done altogether. Even if we had the limitless capacity (and funds) to expand our roads to relieve congestion, the short- and long-term impacts to traffic congestion and the environment would be unacceptable.

Indeed, the transportation system heavily influences environmental, economic, and quality of life issues both positively and negatively. An efficient transportation system minimizes impacts to our air quality, surface and underground water supplies, and helps accommodate growth that reduces the economic costs of living our lives. An inefficient system affects nearly every area of the environment directly and has an indirect set of impacts by inducing growth in areas where our public infrastructure often can't handle it.

The regional transportation plan process is legally required to be financially constrained. What can be done with the available funding? While the lack of adequate funding and public support constrain our ability to do more, the RCP acknowledges that more must be done beyond the conventional transportation planning process to reduce congestion, vehicle miles traveled, and increase the mobility of people and goods around the region with minimal interference. The RCP is founded on the premise that we need to make profound changes in the way we travel today and radically alter the way we plan our transportation system tomorrow.

THE CHALLENGE

Our challenges relative to developing sound transportation policies can be broadly divided into three categories:

- addressing growth in population, employment and households,
- preserving, wisely utilizing, and, when necessary, expanding our infrastructure, and
- funding.

If recent population, household, and employment trends continue in the future, by 2035 the Region will be home to XXX million residents and XXX million jobs. This represents a population increase of XX percent or XX million people between 2000 and 2035 and an increase in employment of XX percent, or XX million jobs.

Unprecedented Demand on Our System

Each major mode in our transportation system faces challenges meeting the growth that is coming our way. While population more than doubled from 1960 to 2000, our freeway capacity increased by less than 30 percent. Consequently, our Region's congestion has increased dramatically affecting both person travel and goods movement. For year 2000, total daily delay due to congestion is estimated to be 1.6 million hours. If current trends persist, this delay is expected to more than double to 3.6 million hours of daily delay by 2030. Moreover, our infrastructure is aging and requires more investment in maintenance and preservation.

Both industry and residents are served by a vast transportation network that includes over 9,400 lane miles of freeway, more than 43,500 lane miles of arterials, several large public transit systems, 10 commercial service airports (including the world's fifth largest), as well as by the two largest cargo-handling ports in the United States, which combined constitute the third largest port complex in the world.

> The miles traveled each work day by single occupancy vehicles in the SCAG region is greater than traveling to the Sun and back to Earth.

Yet the Region's transportation system has not kept up with population and transportation demand. There are over 10.8 million licensed drivers in the SCAG region and over 14 million vehicles registered in the region. Nearly 75% drive alone in their daily commute, averaging 19.2 miles representing 207 million daily miles traveled, which is more than traveling from the earth to the sun and back again, every day.

The Region has invested heavily in transit in the past thirty years and yet the transit ridership has not increased proportionately. Only 4.5% of commuters use transit daily, while 12.7% of commuters carpool.

Crisis in Transporting Goods

The Southern California region is facing a crisis in transporting goods, characterized by a dramatic growth in rail and truck traffic, scarce financial resources, and the high costs of infrastructure improvements. Forecasts of greater regional population and employment, and projections of increasing international and domestic trade volumes, all lead to worsening congestion and the potential of gridlock occurring within the Region's surface transportation system. Almost all of the short haul and significant share of medium and long haul movement of goods occur by truck. Severe congestion due to truck traffic is expected to worsen in the Region's major transportation corridors.

The Port of Los Angeles is the nation's busiest seaport. Together with the Port of Long Beach, they accounted for 24.2% of all U.S. export container traffic and 40.6% of import container traffic in 2005. The ports are ranked the fifth largest container Port complex in the world, with approximately 40,000 TEUs moving every day through the complex. The Ports of Los Angeles and Long Beach together handled 14.2 million Twenty-Foot Equivalent Units (TEUs) in 2005, and 15.8 million TEUs in 2006.

The current forecast predicts the containerized trade volume to triple to 42.5 million TEUs in 2030. These forecasts are capacity constrained at a level significantly below anticipated demand, and are based on an increase of port terminal productivity from 4,700 TEUs per acre per year currently to over 10,000 TEUs per acre per year in

the future. The ability of the ports to handle this unprecedented growth in containerized cargo volumes is critical to the continued health of the local, regional, and the national economy.

Airports play an important role in goods movement, as air cargo is transported in either passenger aircraft belly-holds or in dedicated freight aircraft used primarily for high value, time sensitive shipments. In 2006, the Region's airports handled 2.8 million tons of air cargo. Los Angeles International and Ontario International are the major cargo handling airports, transporting about 96 percent of all regional air cargo, with LAX alone accounting for 75 percent of the traffic. Ontario air cargo traffic has increased by seven-fold since 1979, while LAX has doubled the amount of air cargo handled in the same period. Burbank, John Wayne and Long Beach handle substantially less cargo.

Air Travel

The SCAG Region has 57 public use airports, including eight commercial service airports, 45 general aviation, two commuter airports and two joint-use facilities (military airfields with limited commercial service).

In all, some 88 million annual passengers (MAP) were served in the Region in 2006, more than double the number served in 1980. The level of air passenger demand is forecast to double again before 2035. While none of the individual airports is the largest in the U.S., the Region's airports taken together make Southern California the busiest of all regions in the country.

The need to accommodate future growth is clear and the economic costs of doing nothing are substantial. For every one million regional air passengers, it is estimated that there is a positive regional economic impact of $620 million (in 1998 dollars) and 4,475 jobs. In addition, the number of jobs created by air cargo and freight movement in the region is enormous and vital to the overall health of the regional economy.

Financial Needs

The SCAG region faces significant financial challenges to meet current transportation maintenance and operational needs for the RTP horizon, not to mention what is needed to further improve mobility and air quality in the region.

THE PLAN

Given the challenges we face, SCAG relies on a number of strategies to address the Region's transportation needs. These include an increased focus on operational, management and preservation strategies; land-use integration with transportation investments; and strategic system expansion investments.

Preservation – Protecting our Infrastructure

A key aspect of System Management is protecting our investment in the current transportation infrastructure. The Region has invested billions in developing its multi-modal transportation system and must protect these investments for current and future generations. The Draft 2008 RTP proposes setting aside $XX billion of the additional funds for infrastructure preservation.

Operational Strategies – Getting the Most Out of Our Existing System

In addition to preserving the system, the Region has a responsibility to get the most out of the current system. This is especially true for the State Highway System. Small physical improvements (e.g., auxiliary lanes that extend the merging range) and technology deployments (e.g.,

advanced ramp metering) offer us affordable solutions to restore some of the lost productivity due to increasing congestion. These technology deployments are often referred to as Intelligent Transportation Systems or ITS. The combination of investments reduces delays and the duration of congestion, and improves the predictability of travel time. The Regional Transportation Plan proposes an increase of $XX billion for operational strategies that improve the productivity of the State Highway System through 2035. The total amount of funding represents less than 1 percent of the overall RTP expenditures, but is expected to produce benefits that are almost an order of magnitude higher.

Transportation Demand Management

Transportation Demand Management (TDM) is the all-inclusive term given to a variety of measures used to improve the efficiency of the existing transportation system by managing travel demand. Individual's travel behavior may be influenced by mode, reliability, frequency, route, time and costs, support programs/facilities, perceived personal security and safety, and education.

TDM strategies that encourage the use of alternative modes of transportation to the single occupant vehicle include rideshare (carpools and vanpools), transit (bus and rail), and non-motorized modes (bicycles and walking). SCAGs RTP includes $1.25 billion in TDM investments through 2030, with over $900 million dedicated to non-motorized transportation improvements.

Non Motorized Transportation

The goals of the non-motorized chapter of SCAGs Regional Transportation Plan are to:

- Decrease injuries and fatalities to bicyclists and pedestrians
- Increase accommodation and planning for bicyclists and pedestrians
- Increase bike and pedestrian use

Commuter trips within the region average a self-reported distance to work of 19.2 miles[1], too far for many bicyclists and all pedestrians. However, the integration between bicycle and transit nodes offers the opportunity to extend the commuting range of bicyclists. In addition to work trips, there are many ways that bicycling and walking are playing an important role in our transportation system. According to the 2001 National Household Travel Survey, in urban areas, 50 percent of all trips were less than 3 miles, and 28 percent of all trips were less than 1 mile. These trips are ideal for biking, walking and transit or a combination of those modes of travel.

Bicycle transportation infrastructure has a role in regional mobility and air quality improvements. Every single percent of automobile drivers that switch to alternative transportation choice (walking, bicycles, transit) reduces air pollution, congestion, the need for increasing roadway capacity and, in the case of walking and bicycling, improves public health. By only switching 2-3 miles per day per household, to a non-motorized mode of transportation may result in significant benefits to the region, in terms of congestion and air quality; as well as a significant health benefits for the individual making the trip.

- Decrease bicyclists and pedestrians fatalities and injuries: In 2005, 372 pedestrians and 66 bicyclists were killed in the SCAG Region representing 50% and 57% of pedestrians and bicyclists killed in California

that year. The California Strategic Highway Safety Plan has a goal of reducing bicycle and pedestrian fatalities in the state to 25% below 2000 levels. Proposed ways to address non-motorized safety are:

  - Improve data collection and analysis regarding pedestrian and bicycle trip characteristics, facility condition, injuries and fatalities on roadways within the SCAG Region.
  - Increase accommodation of non-motorized travel in all transportation planning projects
  - Increase education on non-motorized safety among users and motorists.
  - Promote and improve roadway safety infrastructure for non-motorized use
  - Improve bicycle and pedestrian safety expertise among transportation professionals

- Increase accommodation and planning for bicyclists and pedestrians: The needs of non-motorized travel (including pedestrian, bicyclists and persons with disabilities) need to be fully considered for all transportation planning projects. An increase non-motorized planning and funding and the development of a multi-modal mindset among planning, programming and design staff will facilitate the integration of transportation planning to routinely accommodate or consider bicyclists and pedestrians in all transportation projects. This strategy of increased accommodation is intended to increase bicyclist and pedestrian safety as well as lead to an annual increase in bicycle facilities within the region.
- Increase bicycle and pedestrian use in the SCAG region as an alternative to utilitarian vehicle trips: Create and maintain an atmosphere conducive to non-motorized transportation, including well maintained bicycle and pedestrian facilities, easy access to transit facilities, and increasing safety and security. While pedestrian sidewalks are fairly well established in most areas, it is estimated that there are only 3,218 miles of dedicated bicycle facilities in the region, with an additional 3,170 miles planned.
- Increase non-motorized transportation data: To make non-motorized an integral part of the region's intermodal transportation planning process and system, reliable data for planning are needed. Non-motorized transportation data needs include, but are not limited to comprehensive user statistics; user demographics; bicycle travel patterns/corridors; accident mapping; bikeway system characteristics; and sub regional improvements projects and funding needs.
- Encourage Development of local Non-Motorized Plans: Encourage all counties and cities within the SCAG region to develop non-motorized plans and policies for their jurisdiction. Also, non-motorized plans that have been created or updated within the previous five years are eligibility for bicycle transportation account (BTA) funds.
- Produce a Regional Non-motorized plan: Develop a Regional Non-Motorized Plan that coordinates and integrates with all non-motorized plans from counties and jurisdictions in the SCAG Region in a collaborative process, including interested stakeholders.

Strategic System Expansion / Capital Investments

SCAGs transportation planning proposes a balanced investment in all of the Region's modes so that the system performs at the highest level possible.

Highways and Arterials

Southern California's highway and arterial system is the backbone of the region's economic well-being, facilitating the movement of people and goods to and from activity centers, including the region's airports and seaports. Perhaps nowhere else has the automobile and its use been more associated with, and integral to, a way of life than in Southern California.

Despite the importance of this system to the region's livelihood, improvements and additions to the system have not kept pace with the region's population growth and increasing transportation demand. This has been due to the rising costs of system improvements—itself a result of a number of factors such as increased environmental awareness and community opposition and rising costs of materials

Consequently, the region's traffic congestion has increased dramatically, leading to a less productive transportation system with negative consequences such as wasted time and fuel and poor air quality. The preservation, management, and selective expansion of the highway and arterial system are crucial to maintaining the region's economic vitality and quality of life

To effectively maintain and improve our transportation system, the philosophy of system management emphasizes a comprehensive range of strategies rather than just capacity expansion. However, given that the vast majority of all trips rely entirely or in part on the highway and arterial system, strategic expansion and gap closures remain some of the most important improvements that can be made.

Arterial roads account for over 90 percent of the total road network and already carry over 50 percent of total traffic. As it becomes more difficult to add lanes to existing freeways or build new freeways, maximizing the efficiency of arterials becomes an attractive option to increasing overall system capacity in already-developed areas.

Common sense dictates that if the efficiency of an existing system can be maintained at a relatively low cost by proper maintenance that should be taken care of prior to relatively expensive system expansion. The same concept applies to making cost-effective repairs to deficiencies in an existing system prior to expanding it. Our continuing statewide financial difficulties only emphasize the need to follow this prudent method when it comes to spending taxpayer dollars. Therefore, SCAG intends to "fix it first" by taking a serious look at System Preservation

The Strategic Arterial Improvement concept could involve a combination of widening, signal prioritization and other Intelligent Transportation Systems (ITS) deployment and grade separation at critically high-volume intersections to enhance the flow speed and capacity of the arterial. In addition to the specific arterial improvements identified under the Smart Street Improvement Program, this Plan proposes a significant increase in funding for arterial improvements and capacity enhancements.

Public Transportation System

The goals of public transportation services are to ensure mobility for people without access to automobiles and to provide attractive alternatives for drive-alone motorists or discretionary riders. Strategies include a focus on customer

service, financial stability and safety/security to increase desirability of transit as an alternative to the single occupancy vehicle.

Customer Service Focus and Reliability

- All operators that have not done so should establish service guidelines and standards, which focus on benchmarks pertaining to reliability, on-time performance, level and quality of service goals, monitor and report the performance metrics for these goals, and use those goals to meet the needs of current users and attract new users
- All operators should consider utilizing Intelligent Transportation System (ITS) technological means to better monitor and assess performance, and utilize such information to provide users with better information on service to enable more effective use of transit alternatives
- Operators should develop policies and procedures to ease access between transit operators and various transit modes through better coordination of complimentary services, the use and acceptance of universal fare media, and better customer information.
- All transit operators should coordinate with their city and/or county land use planners and building developers when improvements to existing and new transit lines are being considered for new subdivisions.

Financial Sustainability

- Operators need to develop business plans and fare policies that allow for effective cost recovery and maintenance or increases in service levels.
- Operators need to assess services to assure sufficient productivity and cost controls.
- Operators need to look at opportunities for value capture partnerships, where transit contributes to increasing values at and around corridors and stations.

Safety, Security and Emergency Preparedness

- Operators need to continue developing their safety, security and emergency precaution plans that allow for safe and reliable travel of customers.
- As designated first responders, operators need to collaborate with their peers a contingency plan in the event of an emergency.

Bus Rapid Transit

Bus rapid transit is designed to provide fast, high quality bus service, operating in mixed traffic, utilizing low-floor buses, taking advantage of signal priority at intersections, boarding and alighting passengers through streamlined processes, and improving bus stop spacing at planned stations. BRT combines the flexibility of bus systems with some of the features of rail transit. It uses specially identified buses stopping only at major intersections/ destinations.

Metrolink Commuter Rail

Metrolink is the regional commuter rail service that operates in six Southern California counties. Southern California Regional Rail Authority (SCRRA) provides and maintains Metrolink services and facilities. The Metrolink system consists of 53 stations, with one in San Diego County. It carries over 36,000 passenger trips and operates 137 train trips per weekday. The SCRRA looks towards long-range capital improvements that, when fully

implemented, will effectively double the Metrolink System's passenger carrying capacity. The long-range capital plan includes selective double tracking on critical route segments, switching and signal improvements, communication system improvements, new rolling stock, rolling stock storage/maintenance facilities, new stations and enhancements to existing stations.

Strategic Growth Linked to Transportation

Beginning in 2000, SCAG initiated one of the first large-scale regional growth visioning efforts in the nation. Through its Compass Blueprint Growth Vision, SCAG sought to integrate land use and transportation through a consensus-built regional plan. The Vision was developed with the goal of accommodating the six million additional residents expected by 2030, while improving mobility for all residents, fostering livability in all communities, enabling prosperity for all people and promoting sustainability for future generations.

As part of the growth visioning process, SCAG found that by changing the distribution of growth within the Region for future years, there were dramatic effects on the performance of the transportation system. In fact, by reducing population and employment estimates by one million, along with a reallocation of jobs to Los Angeles County from elsewhere in the Region, analysis showed dramatic improvements in air quality as well as mobility. As a result, SCAG initiated a comprehensive growth visioning process called Southern California COMPASS, an innovative effort to develop broad consensus on growth and land use issues affecting the future of the region. This led to the development of a growth vision for the Region that best fits the existing and proposed regional transportation infrastructure, while respecting natural as well as policy constraints that are inherent in the Region. A notable feature of the growth visioning effort has been to engage the public in transportation planning in an interactive process to arrive at a shared conception of the Region's future.

Driven by four guiding principles of mobility, livability, prosperity and sustainability, the Growth Vision provided a policy based growth alternative, encouraging future population and economic growth in strategic opportunity areas thought the region. Specifically, the plan called for mixed use and transit-oriented development, a range of housing and transportation options, jobs-housing balance and more walkable communities in existing and planned centers and along transportation corridors. Using these growth strategies, subsequent analyses found that anticipated growth could be accommodated through modest changes to just 2% of the region that adopt these policy alternatives.

The following policies proved both regionally beneficial relative to their transportation performance, and in tune with the emerging public policy, development patterns and community needs throughout the region.

- Identify regional strategic areas for infill and investment: Identify strategic opportunity areas for infill development of aging and underutilized areas and increased investment in order to accommodate future growth. This strategy makes efficient use of existing and planned infrastructure, revitalizes communities, and maintains or improves quality of life.

  Strategic areas are primarily identified as those with potential for:

  - Transit-oriented Development (TOD)
  - Existing and emerging centers

  - Small mixed use areas.

- Structure the plan on a 3-tiered system of centers development: Identify strategic centers based on a 3-tiered system of existing, planned, and potential, relative to transportation infrastructure. This strategy more effectively integrates land use planning and transportation investment.
- Develop "complete communities": Create mixed use districts or "complete communities" in strategic growth areas, through a concentration of activities with housing, employment, and a mix of retail and services, located in close proximity to each other. Focusing a mix of land uses in strategic growth areas creates complete communities wherein most daily needs can be met within a short distance of home, providing residents with the opportunity to patronize their local area and run daily errands by walking or bicycle rather than by automobile.
- Develop nodes on a corridor: Intensify nodes along corridors with people-scaled, mixed use developments. Many existing corridors lack the residential and commercial concentration to adequately support non-auto transit uses, without which the existing transit system cannot fully realize its potential for accommodating additional trips and relieving the transportation system. These nodes along the corridor also create vibrant, walkable communities with localized access to amenities, further reducing reliance on the automobile for a variety of trips.
- Plan for additional housing and jobs near transit: Plan for additional housing and jobs within reach of the transit network. Pedestrian-friendly environments and more compact development patterns in close proximity to transit serve to support and improve transit use and ridership. Focusing housing and employment growth in transit accessible locations through this transit-oriented development approach will serve to reduce auto use and support more multi modal travel behavior.
- Plan for a changing demand in types of housing: Plan for changing demographics and subsequent impacts on the region's economic future. Shifts in the labor force, as the large cohort of aging "baby boomers" retire over the next 15 years and are replaced by new immigrants and "echo boomers", will likely induce a demand shift in the housing market for additional development types such as multi-family and infill housing in central locations, appealing to the needs and lifestyles of these large populations.
- Continue to protect stable existing single family areas: Continue to protect stable existing single family neighborhoods as future growth and a more diverse housing stock are accommodated in infill locations near transit stations, in nodes along corridors and in existing centers. Concurrently, focusing growth in central areas and maintaining less development in outlying areas, preserves the housing option for large-lot single family homes, while reducing the number of long trips and vehicle miles traveled to employment centers.
- Ensure adequate access to open space and preservation of habitat: Ensure access to open space and habitat preservation despite competing quality of life demands driven by growth, housing and employment needs, and traditional development patterns. Development patterns that focus growth in centers and corridors make the most efficient use of developed land and minimize encroachment on public

open space and natural habitat. This approach would ensure improved access to existing large-scale and neighborhood-scale open space.

- Integrate land use to decentralized regional aviation strategy and job creation: Integrate land use planning to regional aviation investments and subsequent short and long-term employment growth. Adapting land uses surrounding airports, ground access systems and emerging employment centers ensures that growth and transportation investments are suited to the overall regional aviation strategy, and consistent with land use / transportation integration.
- Incorporate local input and feedback on future growth: Continue public outreach efforts and incorporate local input through the Integrated Growth Forecast. This innovative approach provides a more accurate forecast that integrates future land use and transportation planning through growth projections for population, employment, households and housing units. Public workshops, scenario planning, and stakeholder outreach improve the accuracy and feasibility of pursuing regional plans at the local level.

Goods Movement Strategies

The SCAG region handles enormous amount of goods imported mainly from Asia, as well as goods that are exported through the region's major ports and airports. Goods that enter and/or exit the region are moved by any one of the following modes:

- Ocean Carriers: freight moving through the ports via inland-point intermodal service, via long-haul truck or dray, or via dray to warehouse
- Trucking
- Rail Roads: mainline and intermodal yards, as well as on-dock and near-dock facilities
- Air Cargo

Additionally, goods are transported to local warehouses and distribution centers for sorting, consolidation, and then distributed to the next destination.

Ports

In order to handle the unprecedented growth in cargo volumes in the future, the San Pedro Bay ports have implemented or are embarking on the planning and development of specific strategies to increase capacity and enhance operational efficiency in the handling of cargo, while at the same time minimizing the impacts of port goods movement activity on the environment and public health. Some of these strategies that will play a key role in allowing the ports to realize their full potential in supporting the growth in cargo include the following:

- On-dock Rail Capacity Enhancements,
- PierPass Off-peak Program,
- Virtual Container Yards, and
- Port Clean Air Action Plan Strategies

Truck Traffic

The regional transportation system will be challenged to accommodate between 70 percent to 216 percent more truck trips by 2035 according to various estimates of total truck vehicle miles traveled (VMT). Regional strategies to address these capacity needs are discussed below.

Trucks and the current system of local arterial streets, state highways and interstate freeways carry 80 percent of the total value of U.S. freight shipments. Approximately 85

percent of all port related freight movements are made by truck for at least one trip segment. Consequently, trucks have been contributing to the rising concerns of traffic congestion and public health impacts. SCAG's efforts in addressing truck related issues include the following:

- Truck Climbing Lanes,
- Dedicated Truck Lanes, and
- Truck Emission Control Strategies

Regional Rail Capacity Improvement Program

Railroads have been involved in moving freight to, from and through California for over 140 years. There are 31 freight railroads in California operating over 7,420 miles of track. The Union Pacific Railroad (UP) operates the largest portion of the rail network, responsible for 3,708 miles of track. The Burlington Northern Santa Fe Railway (BNSF) operates 1,889 miles or about 25% of the State's rail network.

Over the next 25 years, container volumes at the San Pedro bay ports are expected to triple and at least half of these containers will be transported by rail. Over the same period, the needs for commuter rail will more than double due to population growth. Associated with such projected growth are the series of issues that could impact rail capacity, safety, and the region's air quality. In order to address these issues, SCAG is proposing rail system capacity enhancements, rail grade separations, and exploring alternative methodologies to reduce rail emissions. These strategies include:

- Near Dock Intermodal Yard Capacity Enhancements,
- Rail Mainline Capacity Improvements,
- Rail Grade Separations,
- Rail Electrification, and
- Locomotive Engine Upgrades

Inland Port Concept

Inland Ports and related initiatives have been proposed as solutions to freight mobility issues that cannot be addressed by straightforward capacity increases. The broad potential benefits of an inland port include facilitating goods movement, encouraging economic development, reducing traffic congestion, and promoting the regional objectives.

High Speed Rail Transport System

The HSRT system comprises a long-term vision connecting the region's ports, airports, and urban activity centers. The system can be constructed in multiple stages that can each be financially viable. The financial performance will be enhanced as the system is extended in connectivity throughout the region and the volume of users increases. The HSRT plan is constructed on three core components:

- Goods Movement / Logistics: Link the San Pedro Bay ports with an inland port facility via the high-speed, high-capacity link. This would provide capacity to handle containers relieving a major constraint to port expansion and facilitate efficient and environmentally sensitive goods handling in areas that have sufficient space outside of the urban areas.
- Aviation System: Create a direct and reliable link capable of connecting airports and urban centers. Continue use of LAX as a major hub and sharing demand with other regional airports such as Ontario International Airport (ONT), Palmdale Regional Airport (PMD) and San Bernardino International Airport (SBD) based on a high-speed connection via the HSRT. This

would enable a higher level of service for airport access and connecting passengers, improved operation of the aviation system for passengers and airborne cargo, and optimize investment in aviation system infrastructure.

- Surface Transport System: Link urban activity centers throughout the region, serving the needs of commuters while reducing the number of private vehicles on the road mode. This would lead to reduced traffic congestion, enhanced accessibility between activity centers, as well as reduced air and noise pollution from automobiles. Additionally, enhanced accessibility at transit stations would enable intensification of land uses and thereby encourage more effective land use patterns.

In December 2002, SCAG's Regional Council approved the deployment of a 56-mile IOS of the HSRT system that would connect West Los Angeles via LAUPT to Ontario Airport. It is a component of a 92-mile corridor between LAX and March Inland Port in Riverside County. In selecting the IOS, SCAG considered the RTP performance measures, stakeholder support and environmental issues. At the same time, SCAG's Regional Council approved the advance planning of the LAX to Palmdale corridor and Los Angeles to Orange County corridor.

Aviation

SCAGs Regional Aviation Strategy would accommodate a total regional passenger aviation demand of 170 million annual passengers (MAP). Under the Strategy, rather than relying on expanding existing urban airports, the future demand for air travel will be largely served by using available capacity at airfields located in the Inland Empire and north Los Angeles County where projected population growth will be best served. This plan calls for constraining the LAX to its estimated existing physical capacity of 78 MAP, increasing the Ontario International Airport to 30 MAP, and a new passenger airport at Palmdale that will accommodate 12.8 MAP.

Cooperation between airport authorities is necessary to ensure efficient usage of capacity. Cooperation between airports would be accomplished through the integration of airport master plans, and the development of memoranda of understanding and contractual agreements between airports. These agreements would also identify complementary roles and market niches between airports to increase synergy in the system and maximize utilization of available airport capacities throughout the region. For example, Los Angeles World Airports (LAWA) would play a key role in integrating master plans for the three airports it operates, namely LAX, Ontario and Palmdale.

Airport Ground Access

The Regional Aviation Strategy will have localized ground access impacts at a number of airports. Particularly, the Regional Aviation Strategy will result in dramatic increases in airport activities (people as well as cargo) at Ontario, Palmdale and a number of other airports. A number of freeway and arterial improvements and transit strategies are proposed in SCAGs RTP to address the ground access issues as part of the overall transportation investment in the Region.

TRANSPORTATION GOALS

- A more efficient transportation system that reduces and manages vehicle activity.
- A cleaner transportation system that minimizes air quality impacts and is energy efficient.

TRANSPORTATION OUTCOMES

- Reduce the region's vehicle miles traveled from all vehicles and from carbon-based fueled vehicles to 1990 levels by 2020.
- Reduce the region's use of gasoline and diesel fuel from on-road vehicles to 1990 levels by 2020.
- Accelerate the penetration of vehicles fueled by fuel cells or other non-petroleum based engine technologies.

TRANSPORTATION ACTION PLAN

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Policies															
x			T-1 Ensure that transportation investments are based on SCAG's adopted Regional Performance Indicators.	x	x	x		x		x			x	x	x
x			T-2 Ensure safety, adequate maintenance, and efficiency of operations on the existing multi-modal transportation system will be RTP priorities and will be balanced against the need for system expansion investments.	x	x	x		x	x	x					
x			T-3 Develop a collaborative implementation program that identifies required actions and policies for RTP land use and growth strategies that differ from expected trends.	x	x	x		x	x	x			x	x	x
x			T-4 Support and encourage High Occupancy Vehicle gap closures that significantly increase transit and rideshare usage.	x	x	x		x		x			x	x	xx
x			T-5 Monitor progress of the RTP, including timely implementation of projects, programs, and strategies.		x					x					
		x	T-6 Address SAFETEA-LU requirements that call for improved consultation with environmental and natural resource stakeholders when considering transportation funding plans, programs, and projects.	x	x	x	x	x	x	x				x	x

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Initiatives															
x			TSI-1 Use the Compass 2% Blueprint strategy to influence the funding of future transportation planning and investments.	x	x	x		x	x	x			x	x	x
		x	TSI-2 SCAG shall help coordinate regional, State, and federal consensus on how to address the additional strategic investments and technological breakthroughs necessary to meet mobility and air quality goals.	x	x	x		x		x			x	x	x

[1] Southern California Association of Governments 2006 State of the Commute

Water

THE CHALLENGE

Providing adequate water resources for Southern California's growing population will be a challenge. The SCAG region is predicted to grow by six million by 2025, yet the quantity of water imported to the region will likely decrease—as water is diverted to competing demands such as population growth outside the region and environmental needs.

The reliability of water imported to California from the Colorado River, for example, has decreased over the years. Southern California now competes with other western states and Indian reservations for water from the Colorado River. Population growth throughout the West and activities in the upper basin headwaters of the Colorado will decrease the reliability of water supply from the Colorado River to California. Environmental needs may further restrict water diversions, since more than 50 federally listed endangered species depend on adequate flows in the Colorado for their survival. The Metropolitan Water District of Southern California, however, is working on storage and other measures to increase the reliability of water supplied by the Colorado River.

The Metropolitan Water District of Southern California is also working to increase the water supply reliability of the State Water Project (SWP). Numerous factors have caused the deterioration of quantity and quality of the SWP supply—including aging infrastructure, sinking Delta levees, and increasing restrictions to help protect the Bay-Delta ecosystem. The Water District predicts that there is only a 15% chance that existing SWP facilities can deliver Metropolitan's full entitlement of 2 million-acre feet any given year. Thus, the Metropolitan Water District is working with the CALFED Bay-Delta Program, a multi-billion dollar project to restore the Bay-Delta's ecosystem and improve the reliability and quality of water export, and Metropolitan is investing in groundwater banking to help ensure adequate water supply during dry years when the Bay-Delta's ecosystems are most vulnerable.

Considering the challenges that face water supplies from the SWP and the Colorado River, extensive regional effort and coordination will be necessary to meet Southern California's future water needs. Thus, it will be necessary to invest in regional water conservation, surplus storage, water recycling, and groundwater recovery measures.

THE PLAN

The Regional Urban Water Management Plan

Urban water suppliers serving more than 3000 customers are required to prepare an urban water management plan pursuant to the California Urban Water Management Planning Act (Water Code §10610-10656). Urban water management plans evaluate feasible water efficiency, recycling, and conservation activities, and must be updated and filed with the California Department of Water Resources every five years, with the last plans filed in 2005.

Metropolitan Water District (MWD) is the largest water supplier in Southern California and serves supplemental water to most Southern Californians. Thus, local officials interested in water issues need to understand MWD's 2005 Regional Urban Water Management Plan and localities would benefit from actively participating in the process to update future Urban Water Management plans. The 2005 Plan, for example, includes a comprehensive water resources strategy, labeled Integrated Resources Planning (IRP), which is expected to provide the region with reliable and affordable water supply for the next 25 years.

Methods to Increase Local Water Supplies

Since the regional population is growing while the supplemental water supply is diminishing, the region will need to rely on methods to increase locally available water supply. Potential methods include: water management practices (water conservation); surplus storage (conjunctive use); water recycling; and seawater desalination.

- **Demand management measures (water conservation)**: Water conservation is an effective and relatively low-cost method to reduce demand for water. Considering the cost and future uncertainty of importing water to the region, an emphasis on reducing water demand is an essential part of Southern California's water future. Water districts, in coordination with local partners, will benefit from continually supporting water conservation programs, including education, outreach, incentives and, if necessary, mandates to reduce regional water demand. Existing programs, such as ultra-low-flush toilets, low-volume showerheads, and water-smart landscaping, have made significant reductions in water demand in the region. Future support for effective demand management programs will be crucial to accommodate Southern California's growing population.
- **Groundwater and Local Water Supplies**: Effective long-term management of groundwater resources is essential. A particularly promising method of groundwater management is conjunctive use. In simple terms, conjunctive use is the practice of recharging groundwater basins during wet periods and then using this surplus water during dry periods. This technique has been employed in Southern California since the 1950's, and there are currently numerous conjunctive use programs in Southern California and millions of state dollars being invested into future conjunctive use projects. Refer to Metropolitan Water District's Regional Urban Water Management Plan (2000, III-33) for more details on the relationship between groundwater management and augmenting local water supplies.

  In addition to maintaining the quantity of groundwater supply, long-term commitment to groundwater quality is also imperative to ensure the long-term supply of reliable water for Southern California. The federal Superfund program is beginning to show progress toward maintaining and increasing groundwater basin production, and future high-quality groundwater is possible if groundwater management receives continued commitment from local partners.
- **Water recycling**: Water recycling is the treatment and disinfection of municipal wastewater to provide a water supply suitable for non-potable (non-drinking water) purposes. Potential uses include irrigating landscape, filling lakes, recharging groundwater basins, and providing water for non-potable uses, such as toilets and industrial uses. An initial obstacle to using recycled water for indoor, non-potable, uses is the need for dual plumbing, which is a plumbing system that dually supplies recycled and potable water. Other issues that are slowing the use and acceptance of water recycling include cost, water quality, regulations, institutions, and public acceptance. Although the long-term benefits of water recycling projects tend to outweigh the total costs, the initial infrastructure costs are high. Without education and outreach the public may be resistant to recycling wastewater, and, thus, communities may be concerned

about investing in a potentially controversial project. Furthermore, strict state regulations about the use of recycled water limit the potential beneficial uses and increase the associated costs. Water suppliers are also often disconnected from wastewater facilities, and, thus, considerable coordination is needed to transfer treated water from the wastewater facility to the potential non-potable uses. Successful water recycling projects will depend on coordination among institutions, regulators, and the public.

- **Seawater desalination**: Historically seawater desalination has not been an economically viable alternative in Southern California, but technological advances may make it a cost-effective option in coming decades. Recent seawater desalination projects proposed in Tampa Florida and the island of Trinidad suggest that, under the right conditions, desalination may be an attractive alternative. The Tampa project, for example, is expected to provide water as low as $560/AF.[1] Although the Tampa project benefits from unique characteristics such as low-cost energy that would not be available in Southern California, the project suggests that seawater desalination may be feasible elsewhere.

Potential Impacts of Growth Patterns on Water Demand

This section of the water supply discussion focuses on a preliminary comparison of the expected impact of two different future growth patterns on water demand and supply. This comparison, between a compaction pattern and a dispersion pattern, is intended to serve as an impetus to further consideration of the relationship between types of growth and water supply/demand and water quality.

Compaction versus Dispersion

A compact growth pattern would be expected to demand substantially less water than a dispersed pattern. The compaction growth pattern illustrated in "Possible Visions: Southern California-2025" assumes infill within the relatively cooler coastal zone with proportionally more multifamily housing than the dispersion pattern. Factors such as climate and proportion of multifamily housing are important factors affecting water demand (SCAG's 1994 Regional Comprehensive Plan and Guide, p. 10-8). The average residential per capita water use for the Coastal Zone is 97 gallons per day, in contrast to the average Desert Zone demand of 162 gallons per day (RCPG, p. 10-8). Thus, the cooler, denser, compaction growth patterns would be expected to have significantly less water demand than the less dense, warmer, inland dispersion pattern.

A compact growth pattern would help maintain the local water supply. On a regional level, a compact growth pattern would result in less impervious surfaces than a disperse pattern. The compact pattern includes more natural areas that would allow surface water to recharge groundwater aquifers. Thus, compact growth would help maintain the local water supply.

For a more comprehensive discussion of the effects of different growth patterns on the environment, refer to "Our Built and Natural Environment: A Technical Review of the Interactions between Land Use, Transportation and Environmental Quality."[2]

As information is gathered over the next several months, SCAG will conduct a broad comparison of likely impacts of the various regional growth patterns on future water quality and water supply/demand.

Water Quality

Land use dramatically affects water quality. In natural areas with vegetative cover and little human disturbance most rainfall soaks into the soil (infiltration). In urbanized areas, however, rainfall instead becomes runoff because surface water is unable to soak into impervious surfaces. Although the transport of runoff through communities and watersheds varies depending on storm conditions, hydrology and actual land uses and practices; in general, water quality diminishes as runoff volumes rise.

Growth and Land Coverage

The nexus between growth and water quality occurs with the land coverage created by new roads, parking lots, buildings and infrastructure. As population and economic growth create more impervious surfaces, many natural water processes are compromised or eliminated.

As stated above, impervious surfaces prevent the water infiltration that recharges groundwater aquifers—important sources of water and water storage. These impervious surfaces include roofs, pavement and other hardscape. Impervious areas include both buildings (such as houses, factories and stores) and transportation-related areas (such as roads, driveways and parking lots). Typically, transportation-related activities take more than half of all impervious areas where residential and commercial land uses occur. This dominance is expected to grow as increases in vehicle ownership and miles traveled develop.

Runoff varies with land use. In vegetated areas runoff is much lower and slower than commercial areas. For example, the runoff volume from a one-acre parking lot is almost 16 times the runoff volume from an undeveloped meadow.[3] Parkland runoff that may take an hour to reach a storm drain while parking lot runoff may take only minutes. These differences in flow rates have both pollution and flooding consequences.

Impacts of Runoff

The combination of frequent and intense storm events and impervious areas brings higher risks of flooding. With higher flow rates this urban runoff will demand higher capacities from the local storm drain system. If these capacities are deficient, flooding with attendant property losses may occur.

Runoff that is directed to storm drains has minimal chance for infiltration into groundwater aquifers, limiting local water supplies and storage potentials.

High flow rates of runoff increase erosion, as well as the risks of sediments moving to new locations in the local watershed.

As runoff volumes increase the potentials for natural water filtration diminish. These natural processes occur as water is filtered through sediments or soil particles or exposed to microbes.

Pollution Sources and Land Use

Besides the effect on flow, land use directly affects water quality in many other ways. To understand these effects we need to differentiate between point source pollution and nonpoint source pollution.

Point source pollution refers to contaminants that enter a watershed usually through a pipe. The location of the end of that pipe is documented and the flow out of that pipe is subject to a discharge permit issued by a Regional Water Quality Control Board. Examples of point source pollution are discharges from sewage treatment plants (the wastewater is treated but under the terms of its permit

this water still has permissible levels of pollutants in the discharge) and industrial facilities. Because point sources are much easier to regulate than nonpoint sources they were the initial focus of the 1972 Clean Water Act. Regulation of point sources since then has dramatically improved the water quality of many rivers and streams throughout the country.

Unlike point source pollution, nonpoint source pollution, also known as "polluted runoff," has a defused identity. Nonpoint pollution comes from everywhere in a community and is significantly influenced by land uses. A driveway or the road in front of a home may be sources of pollution if spilled oil, leaves, pet waste or other contaminants leave the site and runoff into a storm drain. Nonpoint source pollution is now the major water quality problem in the U.S.

Common nonpoint source pollutants in urban areas are sediment, pathogens, nutrients, pesticides, oxygen-demanding substances, heavy metals, and oil and other petroleum products:

- **Sediment** is a frequent pollutant associated with development activities. It affects aquatic life, shortens reservoir life, and complicates water treatment. Its sources are agricultural land erosion, construction sites, washoff from streets and other impervious areas, and streambank erosion.
- **Pathogens** include E. coli (a bacteria used to indicate the presence of fecal waste) and other viruses, bacteria, and protozoa. The source of most pathogens is fecal material from any warm-blooded animal. In rural or agricultural areas, sources include wildlife, livestock manure, and malfunctioning septic systems. In urban areas the major sources are pet wastes, wildlife that may be present in high numbers (such as birds), septic systems in unsewered areas, and sewage treatment plant discharges (which are considered a point source).
- **Nutrients** of concern are primarily nitrogen and phosphorus. High concentrations of nitrate in drinking water are toxic to infants and may be harmful to pregnant women. Phosphorus leads to overproduction of algae that clog lakes and reservoirs. Sources of nutrients in agricultural areas include fertilizer, livestock manure, and septic systems. Sources of nutrients in urban areas are fertilizer used on lawns, gardens, and golf courses; pet waste runoff; and discharge from sewage treatment plants or industry.
- **Pesticides** can be a concern in drinking water supplies that use surface water. Sources of pesticides are simpler to identify than sources of pathogens or nutrients. They are limited to pesticide application, either in agricultural or urban areas. Studies show that pesticides like diazinon, an insecticide for lawns and gardens, are found frequently in urban areas.
- **Oxygen-demanding substances** consist of organic matter that depletes dissolved oxygen when decomposed by microorganisms. Dissolved oxygen is critical to maintaining water quality and aquatic life. Urban runoff with high concentrations of decaying organic matter (such as leaves, grass clippings, and other organic debris) can severely depress dissolved oxygen levels after storm events, impairing the water quality on which plants and fish depend.
- **Heavy metals** include lead, copper, cadmium, zinc, mercury, and chromium. They can accumulate in fish tissues and affect sensitive animal and plant species. Sources of metals are automobiles (copper is lost from brake pads, for example), industrial activities, illicit

sewage connections, and atmospheric deposition (for example, mercury that is released into the air from combustion and then falls to earth in rainfall at another location).

- **Oil and other petroleum products** degrade the appearance of water surfaces, impair fish habitats, and may be toxic to sensitive species. Sources are oil leaks; auto emissions coming off parking lots, roads, and driveway; and improper disposal of waste oil. Concentrations of petroleum-based hydrocarbons are often high enough to kill aquatic organisms.

Imperviousness and Water Quality

Buildings, roads, sidewalks, and other impervious surfaces define the urban/suburban landscape. Impervious surfaces alter the natural hydrology and prevent the infiltration of water into the ground. Impervious surfaces change the flow of stormwater over the landscape. In undeveloped areas, vegetation holds down soil, slows the flow of stormwater over land, and filters out some pollutants, by both the slowing the flow of the water and trapping some pollutants in the root system. In addition, some of the stormwater filters down through the soil, replenishing groundwater sources.

As land is converted to other uses such as commercial developments, many of these natural processes are eliminated as vegetation is cleared and soil paved over. As more impervious surface coverage is added to the landscape, more stormwater flows faster off the land. The greater volume of stormwater increases the possibility of flooding, and the high flow rates of the stormwater does not allow for pollutants to settle out, meaning that more pollution gets concentrated in the stormwater runoff.

Research on urban stream protection finds that stream degradation occurs at relatively low levels of imperviousness of 10% to 20%. Wetlands suffer impairment when impervious surface coverage surpasses 10%. Fish habitat, spawning, and diversity suffer when imperviousness is greater than 10% to 12%. Wetland plants and amphibian populations diminish when impervious surfaces are higher than 10%. The higher the percent impervious surface coverage becomes, the greater the degradation in stream water quality tends to be. Based on this research, streams can be considered stressed in watersheds where the impervious coverage exceeds 10% to 15%.

The link between impervious surfaces and degraded water quality argues for careful comparisons between dispersed and compact development strategies. On a regional or watershed level, greater overall water quality protection is achieved through more concentrated or clustered development. A clustered approach will decrease the overall impervious cover, resulting in greater protection for the overall watershed, as a much larger percentage of the watershed will be left in its natural condition, preserving water quality. In addition, such centralized development can be directed away from sensitive areas such as stream banks to minimize the negative impact on water quality.

Green Infrastructure and Green Building

Green infrastructure and green building addresses a number of above identifies issues, including:

- providing on-site capture for use and reuse
- reducing landscaping irrigation needs
- reducing runoff
- reducing interior water use through building efficiencies

- emphasizing areas already served by municipal water and minimizing increases in impervious surfaces

WATER GOALS

- Develop sufficient water supplies through environmentally sustainable imports, local conservation and conjunctive use, reclamation and reuse to meet the water demands created by continuing regional growth.
- Achieve water quality improvements through implementation of land use and transportation policies and programs that promote water stewardship and eliminate water impairments and waste in the region.
- Foster comprehensive and collaborative watershed planning within the region that produces waterwise programs and projects with multiple benefits and ecosystem protections, integrating local government planning efforts with those of special districts, environmental advocates and other watershed stakeholders.

WATER OUTCOMES

- Regional per capita water demand reduced by 25% by 2030 with waterwise land use and local management policies. (Local land use policies and water practices are established to maximize efficient use of local water resources and reduce water demand in the SCAG region.)
- Regional water impairments eliminated by 2030 with the use of stormwater and urban runoff controls and improved retention and infiltration systems. (Land use and transportation policies are established to minimize pollution entering water bodies and increase on-site water management.)
- All member agencies included as active participants in regional watershed planning and implementation efforts, including concurrent updating of basin plans within the region. (Coordination and collaboration of local agencies, water districts and other watershed stakeholders to maximize all investments in water management for public benefit.)

WATER ACTION PLAN

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Policies															
x			W-1 Create a compendium of best management practices, case studies, and model ordinances that will give 'waterwise' guidance for development entitlements and growth management policymaking.				x								
		x	W-2 SCAG promotes water conservation awareness throughout the region, featuring the connections between water and other resources, including energy and the timing of water use.			x	x	x							x
	x		W-3 Encourage water reclamation throughout the region where it is cost-effective, feasible, and appropriate to reduce reliance on imported water.				x	x			x				x
		x	W-4 Encourage coordinated watershed management planning at the sub-regional level by (1) providing consistent regional data; (2) serving as a liaison between affected local, state, and federal watershed management agencies; and (3) ensuring that watershed planning is consistent with comprehensive regional planning objectives and challenges.				x								

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
		x	W-5 Facilitate information sharing between local water agencies and local jurisdictions throughout the region, in order to evaluate future water demands, prepare realistic Urban Water Management Plans, and support sustainable water and growth management policies.	x			x								
		x	W-6 Encourage the integration of water stewardship practices and unify investment incentives among all stakeholders, prioritizing resources for those investments that optimize returns and outcomes and best meet fiscal limitations, growth realities and sustainability objectives.				x								
	x		W-7 Provide, as appropriate, legislative support and advocacy for regional water conservation, supply, and water quality projects.				x								
	x		W-8 Develop a policy framework for integrating water resources planning and Blueprint 2% planning strategies in order to coordinate positive interactions between local land use policies and regional water supply and water quality actions over time.	x			x								
Local Government Policies															
x			W-9 Consider potential climate change hydrology and attendant impacts on available				x		x		x				x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			water supplies and reliability in the process of creating or modifying systems to manage water resources for both year-round use and ecosystem health.												
x			W-10 Include conjunctive use as a water management strategy when feasible.				x								
x			W-11 Require urban development and land uses to make greater use of existing and upgraded facilities prior to incurring new infrastructure costs.	x			x			x					
x			W-12 Reduce exterior uses of water in public areas by shifting to drought-tolerant native landscape plantings (xeriscaping), using weather-based irrigation systems, educating other public agencies about water use, and installing related water pricing incentives.				x	x							x
x			W-13 Protect and preserve vital land resources such as wetlands, groundwater recharge areas, woodlands, riparian corridors, and production lands.				x		x						x
x			W-14 Amend building codes to require dual plumbing in new construction, and provide incentives for plumbing retrofits in existing development, to enable the safe and easy use of recycled water in toilets and for landscaping.	x			x								

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
x			W-15 Amend ordinances as necessary to allow municipal and private outdoor use of recycled water for all parks, golf courses, and outdoor construction needs.				x								
	x		W-16 Incentivize the use of recycled water through pricing structures that make it an attractive alternative to fresh water in non-potable situations.				x				x				
		x	W-17 Remove salts and other contamination in the region's major groundwater basins in order to increase conjunctive use of water resources and extend groundwater storage.				x				x		x		
		x	W-18 Create stable sources of funding for water and environmental stewardship and related infrastructure sustainability, including purchase and implementation of green infrastructure.				x		x						
		x	W-19 Develop and implement tiered water pricing structures to discourage the waste of water and minimize polluting runoff.				x						x		
x			W-20 Use both market and regulatory incentive mechanisms to encourage 'water wise' planning and development, including streamlining and prioritizing projects that minimize water demand and improve water use efficiencies.				x	x							x

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
		x	W-21 Develop comprehensive partnership approaches to remove and prevent water impairments, replacing the existing regulatory command and control approach that has created delays and distrust.				x								
		x	W-22 Create opportunities for pollution reduction marketing and other market-incentive water quality programs.				x						x		
x			W-23 Require Low Impact Development and natural spaces that reduce, treat, infiltrate and manage runoff flows caused by storms and impervious surfaces.	x			x		x						
x			W-24 Prevent development in flood hazard areas that do not have appropriate protections, especially in alluvial fan areas of the region.	x			x		x				x	x	
x			W-25 Implement green infrastructure and water-related green building practices through incentives and ordinances.	x		x	x	x	x		x	x	x		x
		x	W-26 Integrate water resources planning with existing greening and revitalization initiatives, such as street greening, tree planting, and parking lot conversions, to maximize benefits and share costs.	x		x	x		x				x	x	x
x			W-27 Maintain and update Best Management Practices for water resource planning and implementation.				x								

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
		x	W-28 Coordinate with neighboring local governments and watershed stakeholders to identify potential collaborative mitigation strategies at the watershed level to properly manage cumulative impacts within the watershed.				x								
		x	W-29 Adopt MOUs and JPAs among local entities to establish participation in the leadership and governance of integrated watershed planning and implementation.				x								
		x	W-30 Increase participation in the implementation of integrated watershed management plans, including planning effort initiated in neighboring communities that cross jurisdictional lines.				x								
x			W-31 Pursue water management practices that avoid energy waste and create energy savings or new supplies.			x	x	x							x
State and Regional Agency Policies															
	x		W-32 Develop fair and consistent safety guidelines for the use of reclaimed and recycled wastewater for non-potable uses, in order to facilitate more widespread acceptance and use.				x						x		
x			W-33 Design and operate regional transportation facilities so that stormwater		x		x								

IGR/Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			runoff cannot contaminating the surrounding watershed ecosystem. (Transportation)												

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Initiatives															
		x	WSI-1 SCAG supports research into the feasibility and potential environmental impacts of saltwater desalination as a means of increasing local water supply.				x	x			x				x
		x	WSI-2 Streamline water quality regulatory implementation, including identification and elimination of overlaps with other regulatory programs to reduce economic impacts on local				x								

IGR/Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits									Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space and Habitat	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
			businesses and governments.												
x			WSI-3 To the maximum extent possible, restore pervious surfaces and provide on-site management of stormwater runoff.	x			x								
		x	WSI-4 Improve water quality in the region's imported water supplies.				x								
		x	WSI-5 Prevent non-native/invasive species from adversely affecting regional water supplies and quality.				x								
		x	WSI-6 Encourage the use of stormwater permits on a watershed-wide basis.				x								
		x	WSI-7 SCAG will support the development and implementation of public education and outreach efforts at the local level regarding watershed management for community leaders and educators. In addition, SCAG will encourage the implementation of these policies at schools (K-12).				x								

[1] http://www.sdcwa.org/news/plan2000.phtml
[2] EPA 2000 as posted on www.smartgrowth.org/library/built.html
[3] 2000 EPA